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THE IRON AGE

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JUNE 1, 1939

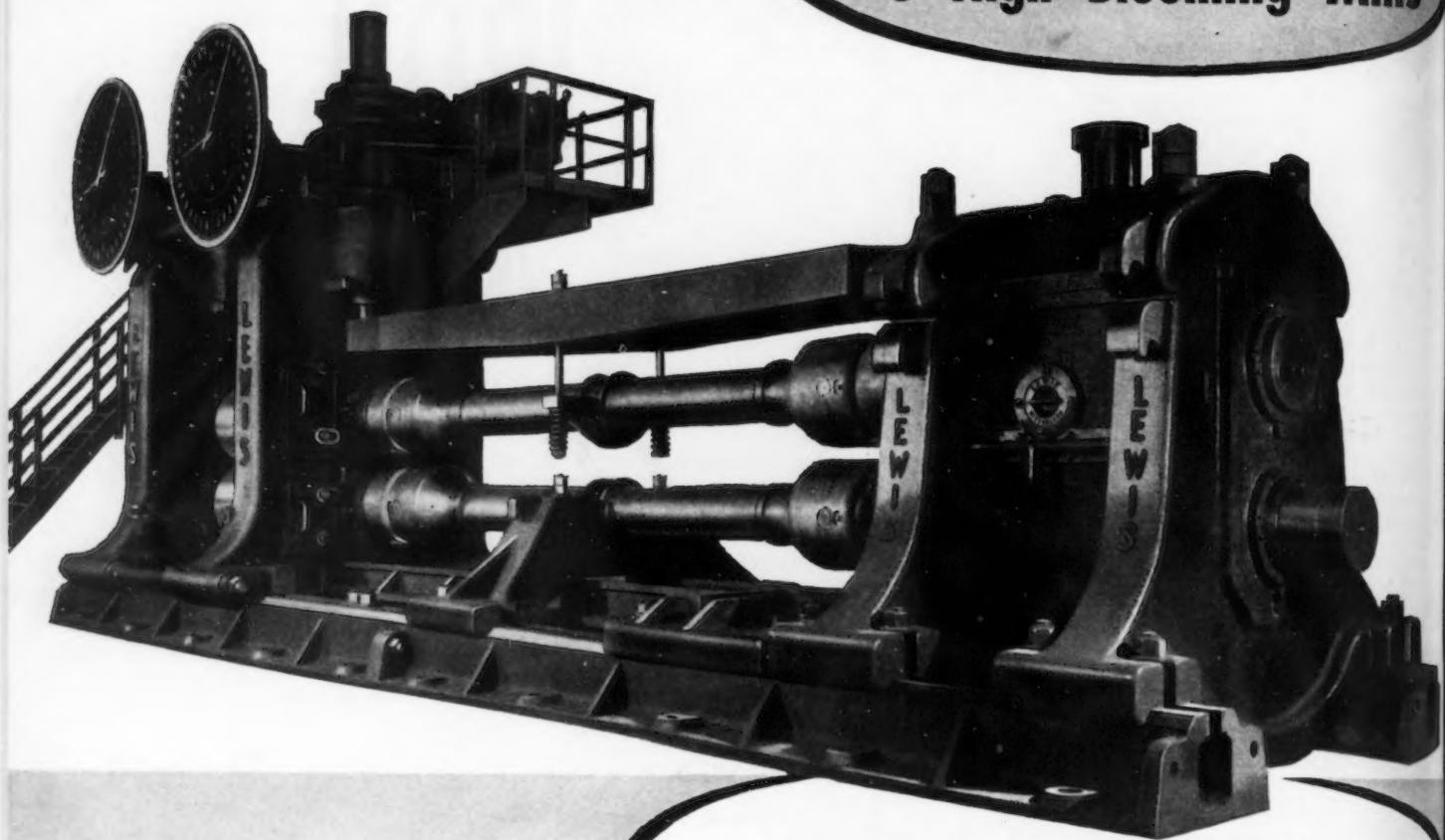
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DIVISION OF BLAW-KNOX CO.
PITTSBURGH, PA.

... THE IRON AGE ...

JUNE 1, 1939

ESTABLISHED 1855

Vol. 143, No. 22

Who Wants War Anyway?

CONGRESS is preparing to pass some laws with teeth in them. Laws that will "take the profit out of war." As if there ever was any profit for anybody, win, lose or draw, in any war.

The purpose is to make it impossible for any industrial concern to expect a profit through making and selling munitions or war material to Uncle Sam during a state of war. And the idea back of that is that business, and particularly big business, won't be keen about pushing us into war, if there is no money in it.

We have no quarrel with the idea of taking the profits out of war—if there are any. And we do not know of a single business man who will object to it either. So far as business is concerned—and labor, too—it will be most welcome if Congress can make getting into a prospective war so difficult and so unpleasant that it will be next to impossible to coax or force us into one.

No, we do not object to the purpose but to the implication that business promotes war for profit. The old "munition maker" bogeyman.

Did the "munition makers" force us into the World War? When we entered that war, a few months after the reelection of President Wilson on the platform: "He kept us out of war," there were not enough munition makers in America to provide us with ammunition and arms for five minutes of active battle service. We fought the war with guns and ammunition labeled "Made in France." We didn't get started turning them out until the war was nearly over.

The World War was a headache to American business. For one concern that earned more than its normal profit in peace times, there were hundreds that suffered loss of profits and that were weakened, disorganized and undermined with respect to future peace-time business. More than one-half of the concerns that were represented in the advertising pages of The Iron Age of 1917-1919 are now out of business. And most of them had war work forced upon them.

No, business men do not want war. And industrialists are as reluctant to turn their plants into arsenals as they are to turn their sons into the trenches to make the world safe for God knows what.

There is only one small group with a hope of profit in war. And that is the vociferous group that looks to war as the golden opportunity to do away with the profit system and the Constitution at one fell swoop. The same group that has been trying to poison the public mind against the business man and the employer as causes of depression, of unemployment and now of war!

If Congress wants to prevent American guns from shooting off abroad, it may best do so by stopping some American mouths from "shooting off" at home.

John Vawter

We have never placed large sheet steel orders with any other company, for the past 33 years. At times we have received lower quotations, but we have always enjoyed such excellent treatment from Inland that it would take more than price to change our business!

Sincerely yours,
A. K. Mannust,
Vice-President

Letter on file at Inland office

Loyal to Inland for 33 years despite lower prices

This excerpt from a letter recently received from an Inland customer typifies the attitude among many steel users who know Inland quality and Inland service.

Using that quality and that service might well lead to important economies in your business.

INLAND STEEL CO.

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SHEETS STRIP TIN PLATE BARS PLATES FLOOR PLATES STRUCTURALS PILING RAILS TRACK ACCESSORIES REINFORCING BARS

HANDLING OF INDUSTRIAL X-RAY FILM

By ROBERT C. WOODS

*Physicist, National Testing Laboratories,
Rochester, N. Y.*

ACCORDING to paragraph U-68 of the American Society of Mechanical Engineers Code for Unfired Pressure Vessels, "all radiographs shall be free from excessive mechanical processing defects which would interfere with proper interpretation of the radiograph."

Certainly, it would not be suspected that this apparently simple single sentence refers to one of the most important, complex, and least studied subjects in the field of metal testing and research. No criticism is intended here except in the most friendly and constructive way, but it is none the less true that few inspection engineers realize how utterly dependent on the proper processing of film are both the accuracy and sensitivity of X-ray testing methods. And while this discussion is primarily aimed at industrial radiography, it is interesting to note that the same laws and processes also apply to other metallographic fields, such as photomicrography.

X-ray crystal analysis, spectroscopy, and, in short, wherever photographic film is used to record engineering data.

In radiography, the actual X-ray technique employed to examine a weld, casting, or other structure may be absolutely perfect, the completed picture may represent an appearance as pleasing as the finest portrait, yet through careless or improper film procedures it may be of as little value as a scrap of paper. From sheer negligence, defects existing in the radiographed object may never be visible in the X-ray image, whereas defects of a purely mythical character may suddenly leap to the eye. It has been the author's experience that too many industrial radiographers will go through the most arduous labor to insure correct exposures, only to later be careless in their treatment of the film.

Photographic film, like so many other scientific devices, is a delicate instrument and must be treated as such. The photosensitive emulsion consists essentially of crystalline silver bromide deposited in gelatin and coated on an acetate compound base.

For reasons even yet not fully understood, silver bromide experiences some kind of change when exposed to light. Whatever the change may be, it is far too small to be detected by chemical methods or microscopic examination, but X-ray crystal analysis does indicate the presence of metallic silver nuclei which increase in number under exposure to light. These silver nuclei themselves are certainly not photosensitive, but they probably play an important role in the formation of what—for want of a better definition—is called the latent image. An exposed film is not really a picture, but just the possibility of a picture; it is a potentiality, a might-be.

Thus far, correct formation of the latent image of a defect in a casting, for example, has been determined by the factors so familiar to the average X-ray operator; X-ray tube voltage and current, target to film distance, exposure time, etc. But whether the recorded defect will ever see the light of day is now solely dependent on methods of development and film handling.

The developer, briefly, is a chemical solution which reduces the silver bro-

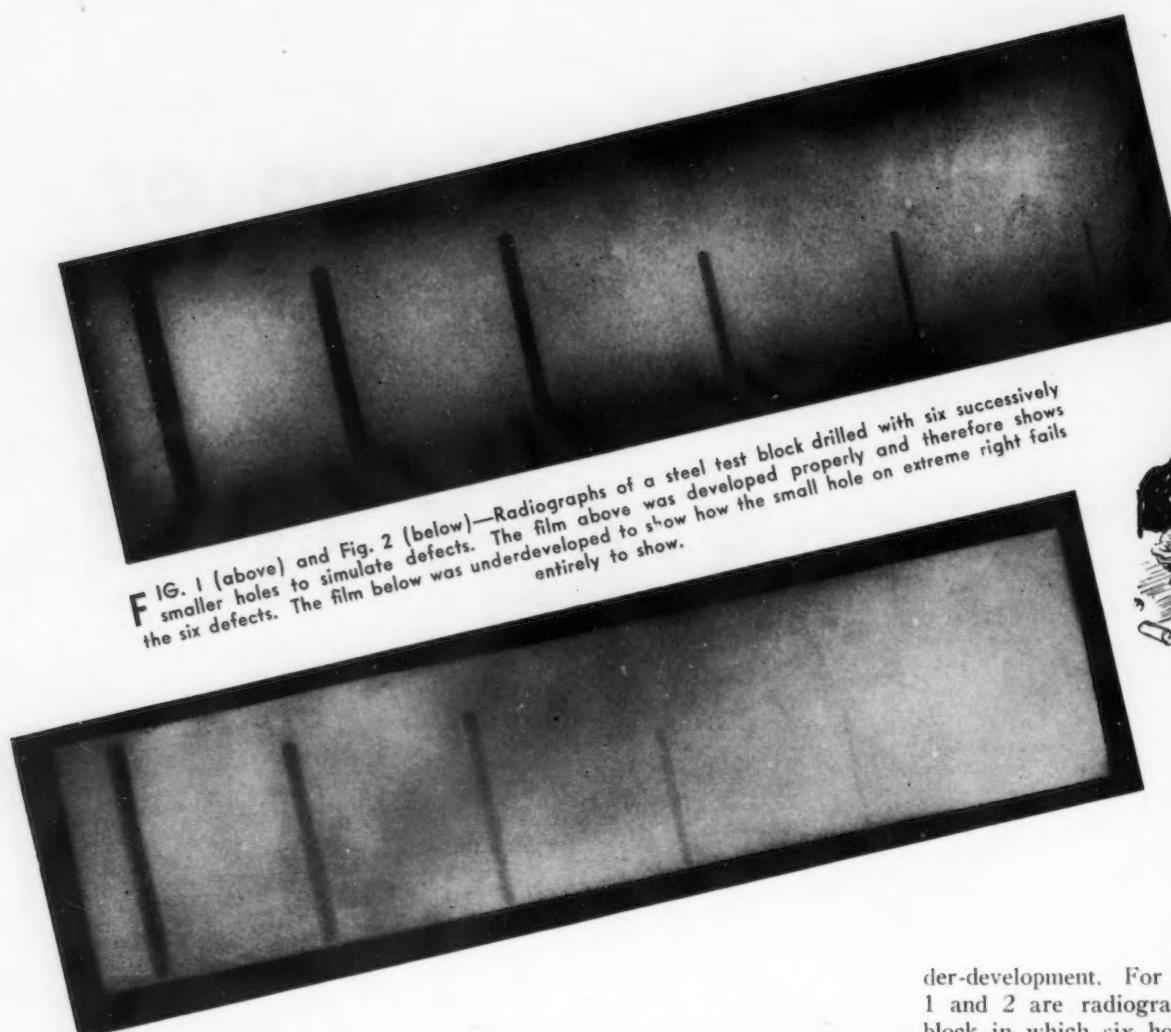


FIG. 1 (above) and FIG. 2 (below)—Radiographs of a steel test block drilled with six successively smaller holes to simulate defects. The film above was developed properly and therefore shows the six defects. The film below was underdeveloped to show how the small hole on extreme right fails entirely to show.



finally converted into the developed image.

When is a Film Fixed?

Fixing solutions merely halt development by dissolving all unreduced emulsion grains. This is achieved in two steps, (1) conversion of insoluble halides into soluble double salts by the sodium thiosulphate in the fixer, and (2) removal of the double salt by washing in water. The question is often asked, "When is a film fixed?" Perhaps it is wisest to follow the general rule and leave the film in the fixing bath at least twice the time required for the opalescence, or smokiness, to disappear. An even longer time, up to 15 min., is preferable.

Turning now to consideration of some difficulties encountered in industrial X-ray work, it is found that film artefacts fall roughly into two classes: (1) those which cause failure to visualize defects actually existing in the radiographed object and already recorded in the latent image, and (2) those which appear to indicate defects where none exist. Most failure to demonstrate recorded defects may be traced to one of several types of un-

der-development. For instance, Figs. 1 and 2 are radiographs of a steel block in which six holes of varying diameters were drilled. All six holes are clearly visible in Fig. 1, but in Fig. 2 only five appear distinctly. X-ray factors in both cases were identical, but the film in Fig. 2 was developed in nearly exhausted solution and as a result one defect cannot be noted. The same omission would have occurred had the film, see Fig. 2, been immersed too short a time in fresh developer or in solution below the normal temperature. Scientific control of time and temperature is one of the most important factors in photographic work.

Dust Causes Trouble

Improper development may also occur in dust-laden atmospheres where the developer acquires a fine coating of scum. This surface scum adheres to the film as it is lowered into the solution and lessens the degree of reduction, either over the whole surface or in restricted areas. One remedy for this condition is to dip the film momentarily in clean water before immersion in the developer. Somewhat similar incomplete development can result from air bubbles clinging to the film surface, but these can be

mide emulsion to black metallic silver wherever the light or X-ray has struck the film. Reaction between silver salts and developer must be selective, otherwise all emulsion grains would be reduced and the film surface would appear uniformly black. Actually, the developer splits the silver bromide into positive and negative ions, as $\text{AgBr} \rightarrow \text{Ag}^+ \text{Br}^-$. For this reaction to continue to completion, silver must be deposited out of solution onto the film. It seems certain, therefore, that the substance forming the latent image—whatever that substance is—is the agent which causes the silver of light-affected grains to deposit and form a picture. Grain reduction is always complete; that is, there is no such thing as a partially exposed or developed silver bromide grain. Shadings and density differences are due to number of grains reduced, not to the amount of reduction. Photographic action is, in short, a response following a stimulus. The stimulus is light or X-rays and the response is the latent image which is

eliminated by film agitation in the bath.

Crowding film too closely in the tank, or placing them too near the side of the container, forms pockets where insufficient solution exists and produces light areas which may either simulate or hide defects.

For dark room work the hands should be kept dry and free from dirt or chemicals. Contamination of film by fingers moist with fixer usually produces light spots, smears, or streaks. Another cause of improper development is partial oxidation of developer on films being held out of the bath for examination by the safe-light. This results in streaks where the oxidized developer has flowed down the film.

Overdevelopment may likewise be dangerous, for too long immersion produces chemical fog on the film and may obscure detail. It must be kept in mind that there is no law governing the form or location of these faded and fogged areas except the laws of chance and it requires but a small amount of either to nullify the whole value of a radiograph.

Numerous phenomena, easily reproduced at will, result in the appearance of defects where none really exist. In the radiograph, Fig. 3, B is a set of lines due to scratching, C an area where a heavy object rolled over the

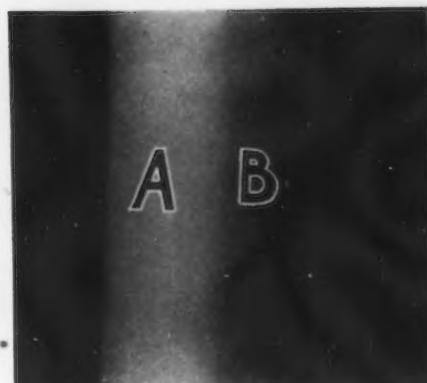


FIG. 4—Radiograph of a steel bar of width AB. Section B is fogged by intensifying screen fluorescent lag from a previous exposure.

film, and AAA are apparently curved defects, but are in reality crimp marks caused by snapping the film between thumb and forefinger while unloading the cassette. The dark smudge D was caused by contact with a finger wet with developer. All these seem easy to recognize here, but when they are shaded in with other shadows in a radiograph, their true nature is sometimes impossible to determine.

Sharpness of a radiographic image is often spoiled by elongation and smearing occurring while the film is in the developer. When a film is allowed to stand in the bath for the full

time without any agitation, development decomposition products run down the surface and cause improper development on the lower areas. Therefore, films should be agitated at least twice during their development to prevent running and chemical fog.

Fluorescence to be Watched

Calcium tungstate intensifying screens have a lag; that is, after a heavy X-ray exposure, they may continue to fluoresce for some minutes. If a fresh film is placed in a cassette immediately after such an exposure and then developed, it will be found to bear the fluorescent image of the previous radiograph. Fig. 4 is the radiograph of a steel bar of width AB. Part B, however, is almost black due to exposure by fluorescent lag. Often this lag takes the form of a spot like a gas pocket or a line resembling a crack. The more transparent portions of the object radiographed may over-expose the screen locally and produce an afterglow image which will show in a subsequent radiograph. Therefore, a sufficient number of fluorescent screens should be on hand so that fresh film is not immediately placed in cassettes which have just been exposed.

This discussion has by no means covered all the troubles to be encountered in the handling of film for industrial radiography. It is merely an

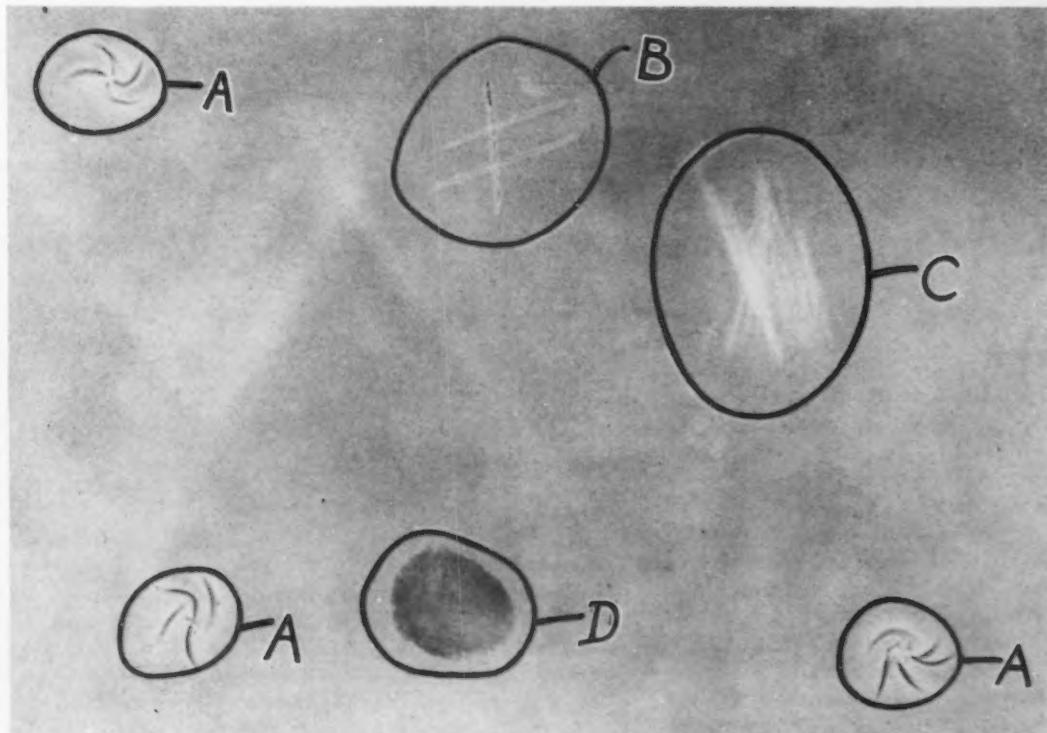
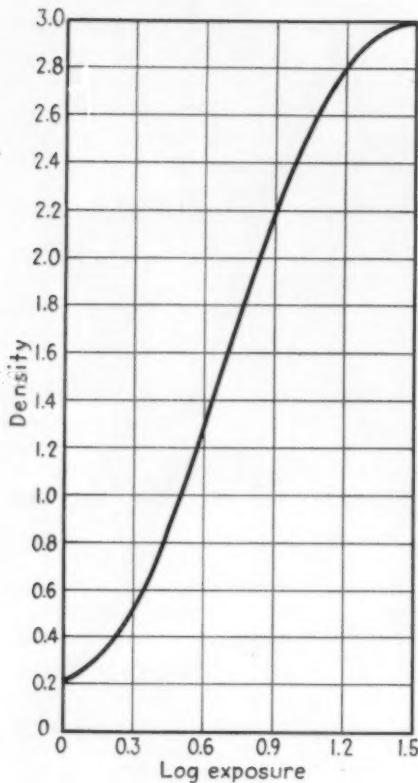


FIG. 3—Illustration of various artifacts caused by improper handling of film. A is a crimp mark from snapping the film; B is a set of lines from scratching; C is the result of a heavy object rolling over the film; and D is caused by contact with a finger wet with developer.



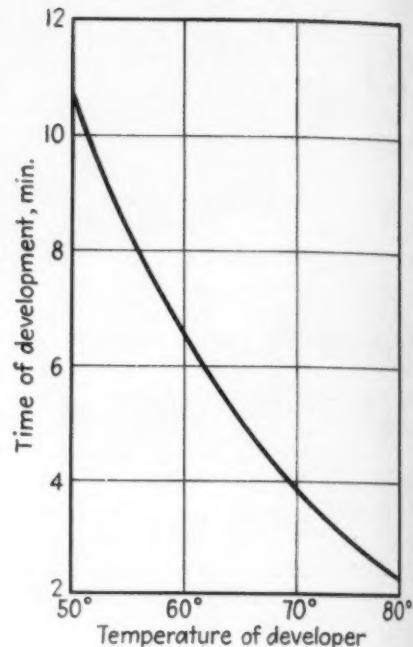
AT LEFT

TYICAL H. & D. density curve for X-ray film with intensifying screens. The slope of the curve indicates film contrast, or ability to demonstrate slight variations in X-ray absorption of radiographed object. Thus, a film with a density of 2, viewed with bright light, will have more contrast and therefore higher radiographic sensitivity than a film with a density of 1 viewed by weaker illumination.

• • •

AT RIGHT

TIME-temperature development chart, for Eastman X-ray developer. Note the steepness of the curve, which indicates the importance of the time factor for small temperature changes.



attempt to call the attention of radiographers and engineers to the fact that here exists a highly important phase of metal inspection work and one which consistently seems to be regarded as a simple matter of routine. Problems mentioned here pertain to workers who have available the

finest kind of equipment as well as to those who process their film in coat closets. It is more a matter of care than apparatus.

It has been the author's observation that wherever film processing is not regarded as a science, there the highest degree of sensitivity the X-ray

method can hope to attain is the detection of flaws which measure 2 per cent or more of the total material thickness examined. But where the proper X-ray techniques are combined with careful film handling, the sensitivity of X-ray inspection, based on the same scale, should be 1 per cent, or less,

Metal Shot Improves X-Ray Photos of Irregular Objects

METAL shot, some so fine they float on water, play an important part in the making of sharply defined X-ray photographs of irregular metal objects at the General Electric Co. Should a radiograph of a monkey wrench be wanted, for example, the technicians would pour tiny shot over and about it—spherical particles of copper or steel so small that 10,000,000 of them nestle together in a mere cubic inch of space. The photograph then obtained has all the edges of the parts of the wrench sharply outlined. Had a similar photograph been made with the wrench

simply resting on the X-ray negative holder in the air, the resulting picture would have very fuzzy or blurred edges outlining the tool.

The explanation, according to C. D. Moriarty of General Electric, is that there is such an emphatic difference in the absorption of X-rays by air and by metals that the part of the X-ray negative not in back of the metal is necessarily over-exposed, with the result that the exposure "spills over" and blurs the edges of the object. Again, when the object being examined has some sections emphatically thinner than other parts, there is a similar fuzziness

or blurring of edges of the object.

The copper shot used in "blocking" an irregular steel object give a background that approaches the opacity of the object, but still is sufficiently less opaque so that the radiograph of the object stands out in contrast. The copper shot used must be extremely fine so they will "flow" freely to fill all crevices, and pack uniformly—as only spheres will—to give a homogeneous background. For some investigations, calling for "blocking" with materials of other densities, similar shot of steel or alloys are employed.

Hardening Long SLENDER TOOLS

THE hardening of .18 per cent parting tools $12 \times 1\frac{1}{4} \times \frac{3}{16}$ in. shown in Fig. 1, has proved to be a troublesome job in some shops due to warpage, which on account of the tool holder design, necessitated much grinding and consequent thinning of the tool.

Of the many suggestions put forward to Wild-Barfield Electric Furnaces Ltd., London, England, to cure the trouble, the gadget shown in Figs. 2 and 3 proved to be most satisfactory. The description of this device appeared originally in the journal of the company.

Four mild steel members, A and B in Fig. 2, were each shaped on one edge to give a line contact, and bolted in pairs with a cast iron distance piece between. A machine table vise C, Fig. 2, was used to house members A and B, A being dovetailed into the sliding jaw and B into the stationary one. Resting on the vise immediately under the parting tool D was a make-up slip on which the tool was placed for air cooling on removal from the furnace.

The vise then was tightened and the make-up slip removed to ensure an unrestricted space around the tool for rapid cooling. Two air jets, E and F in Fig. 3, were arranged as shown, and after cooling the tool was straight to within 0.005 in. An additional benefit, not foreseen, accrued from this method. Trouble had previously been experienced due to breakage about the middle part of the tool, on account of hardness and the fact that certain operations called for an overhang of about 6 in.

It was found that tools hardened by the method outlined, in addition to being straight, were also more or less ductile about the middle part due possibly to the fact that the air from either end met at the middle part in a fairly warm condition, having been heated by its initial contact with the ends of the tool. This would provide a slower rate of cooling about the middle which was, as a consequence, less brittle, and proved to be ideal for excessive overhang.



Fig. 1—Typical parting tool, prone to distort when hardened.

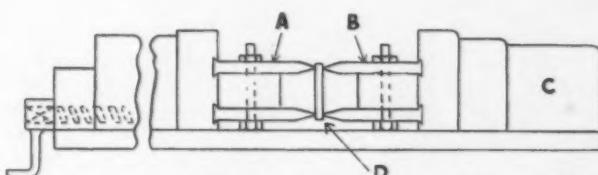


Fig. 2—Jig used to hold parting tool during air blast quenching.

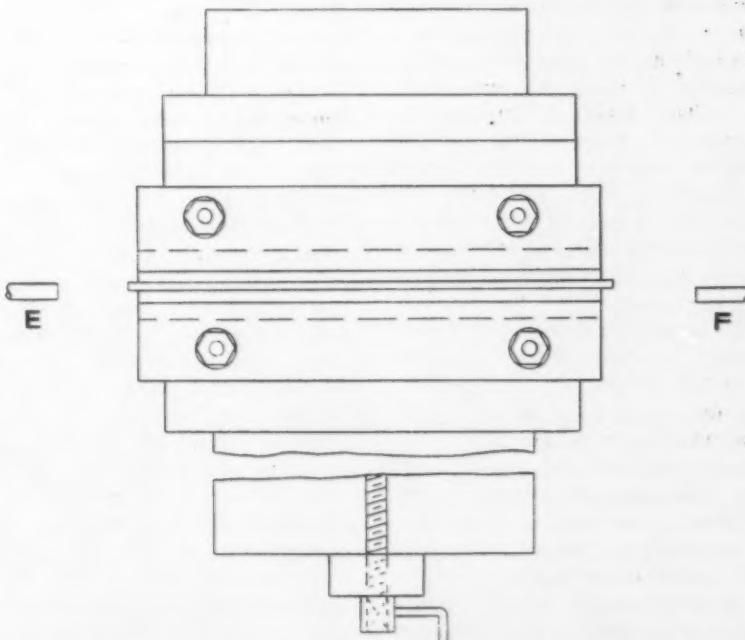


Fig. 3—Parting tool in jig, showing points of application of air blast.

Some Observations on IRON POWDER METALLURGY

By GREGORY J. COMSTOCK
Consulting Engineer, New York

THE molding of parts from iron powder has apparently reached a critical point in its development.

For the information of those who have not been following the details of this interesting development, it might be well to say that the process consists in molding iron powder into parts and articles by much the same technique as that which is employed in the synthetic resin industry. The metallic powders are pressed to shape, consolidated by heat treatment, and are sized by repressing when extra accuracy is desired. The economics, fine tolerances and the elimination of machining operations which the development has practically demonstrated have engendered a large amount of interest at the present time.

This interest in iron powder molding was initially generated by the experimental production of quite a large variety of objects and articles chiefly from sponge iron powder which was made directly from the ore. The possibilities which these sponge iron test parts demonstrated encouraged development and research which eventually resulted in the commercial production of molded iron articles which fall into either one of two natural classifications. Those parts which were developed from powder to display unusual physical structures or attributes, which could not be developed by the

normal casting and machining operations, may be regarded as being one of these types. Parts or articles which can be so economically molded from iron powder for the actual duplication of cast and machined parts as to institute a material reduction in cost constitute the other.

The porous iron bearing and the oil or graphite loaded iron parts are examples of the first class of these products and the special structural effects which are characteristic of them. Parts of this kind were the first products of iron powder molding and were a logical development of the porous bronze powder bearing which preceded them. The technique which was developed in their production is only now beginning to be commercially applied to the production of the solid iron part which is used as an economic substitute for the normal products of casting and machining. A number of such non-porous parts are now, however, being made from iron powder on a production basis. The reduction in cost and accuracy of dimension which is responsible for their use depends primarily upon the *cost of the iron powder from which they are prepared*, and the *efficiency of the manipulations which are employed in their manufacture*. As it has been demonstrated that parts of this kind can be produced with an easily reproducible accuracy of dimension which is within unusually close tolerances; as the strength, density and other characteristics of the parts are in the majority of cases most satisfactory, the remaining factor, that of the cost of raw material is at present the most

important consideration in the further progress of this development.

With one noticeable exception, however, the iron powders which are at present available in a form and purity which is suitable for fabrication into the non-porous parts and articles of the latest developments, appear to be too expensive for this new and larger field of iron powder molding. Carbonyl iron powder can be secured at a price varying from 80c. to \$1.40 per lb. from foreign sources. Iron powder which is produced by the hydrogen reduction of pure iron oxide is quoted at prices varying between 40c. and 60c. per lb., with the possibility advanced of its being produced at from 20c. to 30c. per lb., ultimately, by new processes which are now being investigated. Electrolytic iron powder appears to vary in price between 25c. and 35c. per lb., with prices as low as 15c. per lb. being prophesied as an ultimate potential minimum should pilot plants be expanded to tonnage proportions. Iron powder which is produced by a modification of the sponge iron processes in Sweden is, however, being imported from that country and has been largely applied to the present development at prices which are so materially below the cost of the other forms of iron powder which have just been mentioned that the author for one will give credit to this product for having given the powder iron molding industry at least in this country a major help forward.

Many Schemes Propounded

It has also been the author's privilege to be acquainted with various

past and contemplated production schemes by people who for years have been active in the powder metallurgical field, and respects their manifest hesitation in predicting the "ultimate" price possibilities. Likewise, he has found the Swedes being very conservative and careful in not giving any promises of prices for very large tonnage production, where possibilities of technical difficulties not now fully known, might upset the theoretical calculations.

It is, therefore, of particular interest to observe, that while "theorists" talk about powder iron at prices as low as 2 to 4c. per lb. in tonnages of hundreds of thousands of tons, the Swedes move on the reality of the market and quote prices around the 6c. a lb. limit for tonnages in the mere hundreds of tons, without giving a definite indication of what they can do when the tonnages required go towards the "100,000"—a reality as yet fairly far in the distance.

The tonnage availability, character and cost of the Swedish iron powder makes it more suitable for the immediate application of molded iron parts, than do the three other forms of iron powder which are at present available. Therefore, the Swedish iron powder has been largely used, and has in fact been used as illustration by promoters to further their own schemes of production. There is a great deal of difference between samples from actual economically successful production material and "laboratory" or "pilot plan" material.

The potential demand for iron powder is now becoming apparent. It is arousing considerable interest and not a little promotional effort is being directed towards the possibility of the local manufacture of sponge iron powder from domestic ore. There are, however, a number of factors which will influence such a project.

I feel sure that it can be conservatively stated that the production of low or carbon free sponge iron from domestic ores has been adequately investigated not only in the United States but in the principal European countries as well. Curiously enough these investigations, which included the erection and tonnage operation of very extensive and costly installations, have resulted in the process being abandoned for economic rather than technical reasons in each of the countries in which the experiments were conducted, with the single exception of Sweden. In that country the process has been practiced without interrup-

• • •
VERY large hydraulic presses, such as this one of 4,000,000 - lb. capacity, are necessary for making metal powder compacts of considerable area. Photo courtesy of E. S. Patch, of Moraine Products Division, General Motors Corp.

• • •

tion on a large scale tonnage basis for the past 25 years.

The reason for this is directly associated with the fundamentals of the Swedish steel making practice. They employ the sponge process for the production of their steel melting base, because of the availability of large quantities of an extremely high grade iron ore and because for their better products they prefer to do the least amount of refining which involves oxidation in their furnace practice. Much has been said and written both for and against the principles which are involved in this practice. Several large volumes of controversial literature could easily be accumulated on the subject. The fact remains, however, that large quantities of sponge iron are being and have been produced for many years in Sweden, while the process has been thoroughly tried out and abandoned for economic reasons both in this country and abroad. The end result is therefore that except for

Sweden there are no tonnage facilities available for the production of sponge iron.

The sudden demand for a relatively cheap but pure iron powder has, therefore, been solved by the importation of that product in powder form from Sweden, which alone of all the countries has a large, going, and steady sponge iron production, which can be utilized as a cost reducing backlog for powder produced by a modification of this well established Swedish direct ore process. Furthermore, it seems reasonable to assume that for some time at least the economic advantages which are incident to importing this product from Sweden may very well be maintained, particularly if the cost of the iron powder which is to be used for powder molding is to be an important consideration in the development of the process and its general application to production parts and articles.

(CONTINUED ON PAGE 64)



Why

A SPECIAL FINISH?

By ADOLPH BREGMAN
Consulting Engineer, New York

TO most manufacturers, the question "Why put a special finish on a metal product?" would seem most elementary. The answer is so obviously "for decoration or protection."

As a matter of fact there is some justification for this question. First, there are still too many manufacturers of metal products who do not sufficiently appreciate the importance of special finishes for sales appeal. They understand the need for a coating to retard rust or corrosion; they know for example, that tin, zinc and cadmium and nickel coatings are used to protect steel. But they are not yet awake to the fact that even in industrial products, manufacturers are adopting a new point of view toward finish.

Just as style has become a necessary part of consumer products, not only in novelty and luxury articles but also in the necessities like household equipment and kitchenware, finishes are assuming importance in the most prosaic industrial products—machines and tools. No longer is the finish regarded as an added operation and an added expense—in short, a necessary evil. It may sometimes be the last detail to be decided, but it is no longer the least consideration. It is one of the weighty factors in the design. Properly chosen and applied, the finish may add intrinsic value to the product, or reduce the cost of manufacture.

Let us take for granted the obvious fact that a rust resistant coating applied on a ferrous metal base for purposes of protection is a prime method of improving or adding value to the product. Let us agree also that improvement in appearance also adds value to a metal article, or any other merchandise. It is not yet widely appreciated, however, that the finish can be used more generally to increase the durability, add to length of life

also for hardness and resistance to tarnish. Steel tubes are calorized for resistance to oxidation at high temperatures and resistance to sulphuric fumes. Vitreous or porcelain enamel is one of the most familiar wear and corrosion resistant finishes for consumer products. Long standard for kitchenware and bathroom equipment, it is now coming into use in industry for building fronts, shipping tank linings, household boiler jackets and even gasoline engine manifolds. Aside from decoration, it adds long life and great ease in maintaining cleanliness.

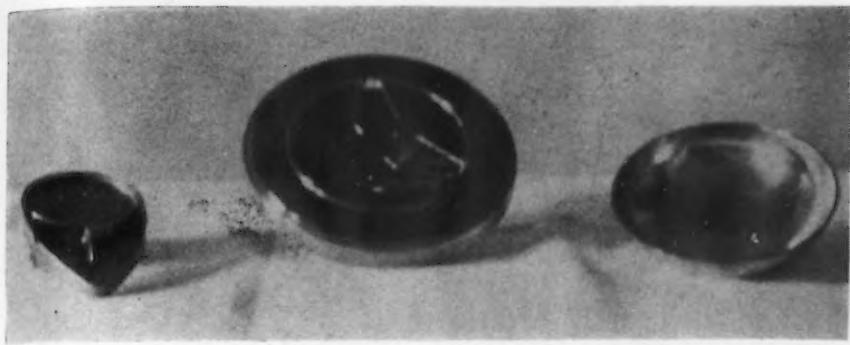
A highly specialized but very interesting example of the use of an essentially decorative product on a novelty for a utilitarian purpose is the lacquer applied to ash trays to prevent blemishes caused by lighted cigarettes and match flames. (See Fig. 1.)

In industrial products also, instances of the use of metal finishes for improvement of product are numerous. Perhaps the clearest illustrations are those involving industrial chromium deposits. Their high hardness (about 800 Brinell) enables them effectively to resist abrasion on such products as printing plates (for very long runs); on dies and rolls (Fig. 2) where they remain free from scratches, permitting the work to retain a smooth surface; in the glass and ceramic industries for resistance to elevated temperatures; in the rubber

THIRD in a Series of Articles on the Economic Aspects of Metal Cleaning and Finishing

and improve the operating characteristics of a metal product.

Present instances of this kind in consumer products are numerous. Silver, gold, and more recently rhodium, are electrodeposited on base metals which are thereby given a surface of a precious metal, the life of which, varying with the thickness of the coating, may be very long (in the case of silverware, even a generation). Coatings of precious metal are numerous on scientific instruments, not primarily for decoration but for their special physical, chemical and electrical properties. Medical and dental instruments are plated with chromium not only for decoration, but



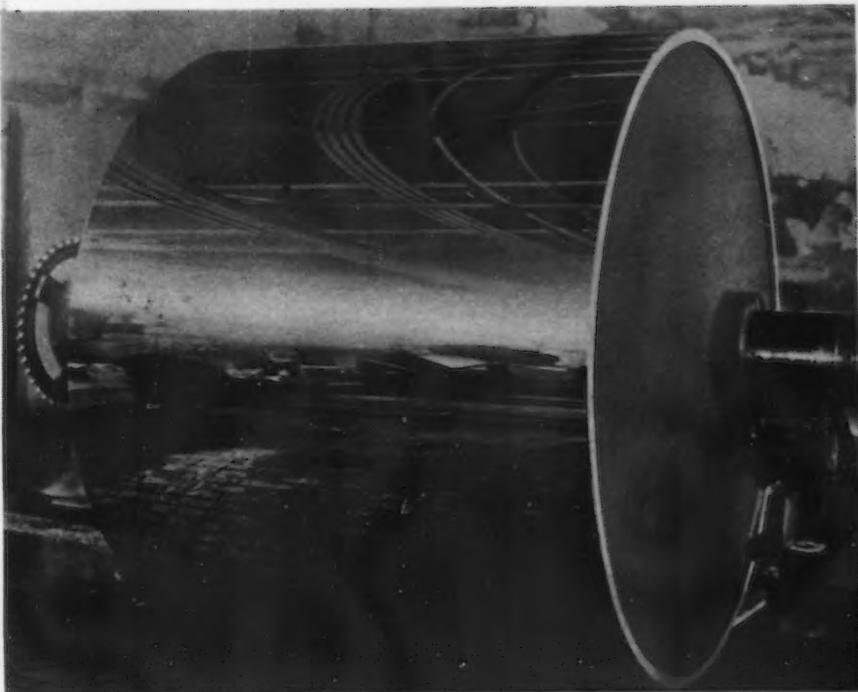
ABOVE

FIG. 1—Ash trays of any shape or size may be protected by burn-proof lacquer. These samples have been finished by Maas & Waldstein.

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and coal gas industries for resistance to sulphur and sulphur compounds. Another advantage in machine parts is that the coefficient of friction between polished chromium and polished steel is about one-half of the friction between polished steel and polished steel; the combination of chromium and steel shows much less tendency to seize, gall or cold weld.

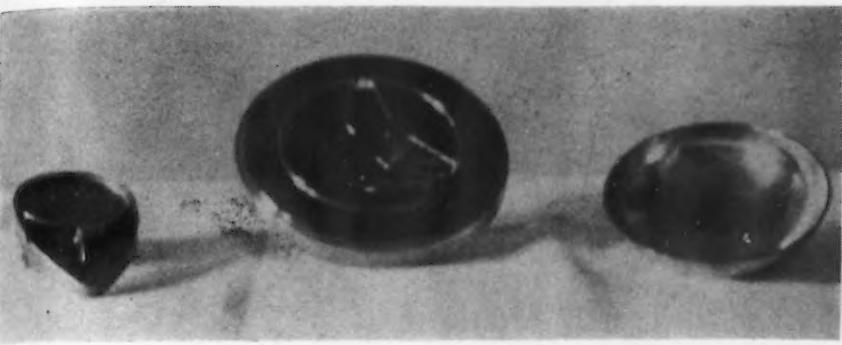
An indirect but important function of a special finish has come to light in the use of electroplate on industrial tools like machinists' wrenches, and for the trim on machine tools. (See Fig. 3.) The additional sales appeal of a special finish on products of this type is probably small as the buyer is as a rule hard-headed and primarily interested in full value for his expenditure in terms of operating efficiency. The purpose of such special finishes is primarily to stimulate the user or worker to take better care of his tools. The machinist will wipe his tools clean at the end of the day providing it seems worth while. There is no incentive to special care in a drab piece of unfinished iron; no special pride in its appearance. But plated and polished parts seem to ask for



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BELOW

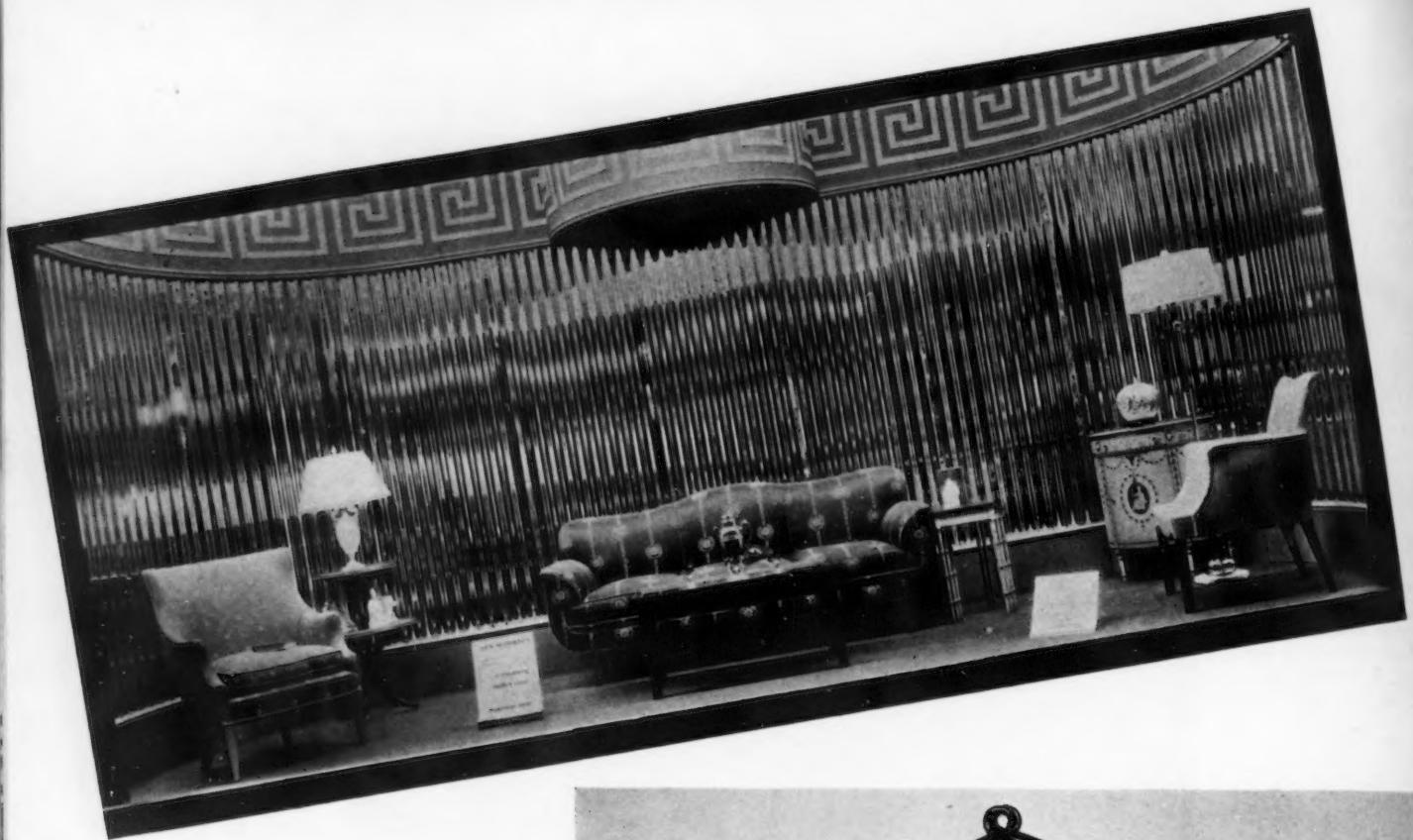
FIG. 3—Chromium plated machinists tools. They wear better, look better and receive better care. Photo from United Chromium, Inc.



a little extra treatment to be kept bright. And more often than not, they receive it.

Only recently in this country, although for some years in England, heavy electrodeposits of hard nickel have been used for wear resistance. Coatings up to 0.2 in. have been deposited to protect alloy and mild steel bases against abrasion. The physical properties of deposits of this type compare favorably with cast and rolled

nickel and are considerably above mild steel; the part is thereby given a surface of high grade material, excellently suited for service where the attack is concentrated on the surface. Industrial deposits of nickel are also used to build up steel parts worn down to undersize in service or mismachined to under-



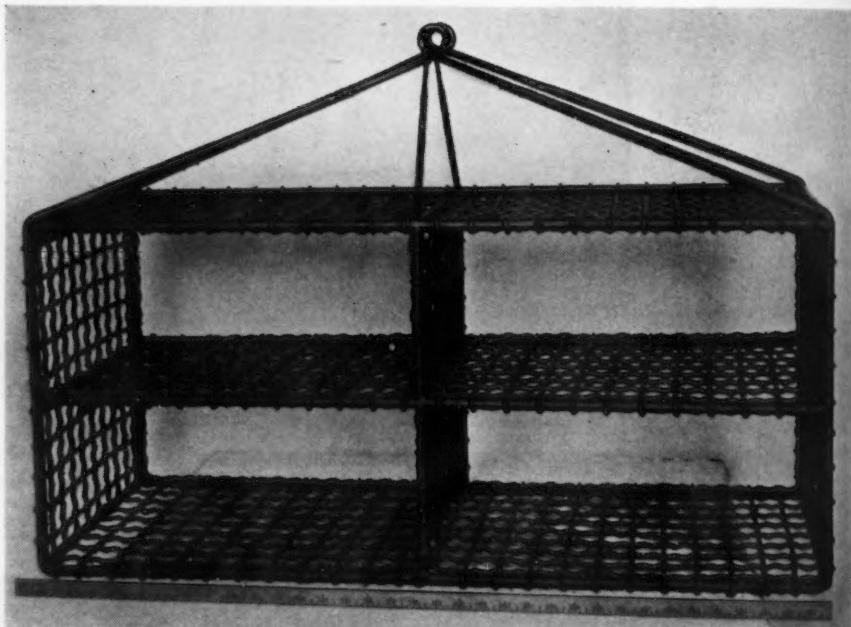
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SPLENDOR at moderate cost. Permanent backgrounds for show windows of McCreery's department store, Pittsburgh, made from Apollo ChromZinc, 0.012x36x84 in. These are zinc sheets, plated with copper, nickel and chromium. The same finish is applicable to steel, copper, brass and tin plate in sheets, strip, coiled and flat wire. Photo by Apollo Metal Works.

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AT RIGHT

PROTECTION of low cost base materials. A latex covered dipping basket, 15x16x36 in., of 1½-in. wire mesh. The hard black latex is 0.060 in. thick. The basket is used for cleaning rectangular metal containers. Photo from United States Rubber Co.



size by error, thus reclaiming at comparatively low cost, parts which would otherwise have to be scrapped.

Outstanding examples of the improvement of a product by the beneficiation of its surface are found in the treatment of aluminum. By anodic oxidation the surface is changed to a hard, clear aluminum oxide, highly resistant to abrasion, oil, food stains, finger marking, heat and smudging, and also making it an excellent electric insulator. Similarly, the Alzak process improves an aluminum surface, making it brilliant, hard and durable, for use in reflectors. A recently developed process for electroplating on aluminum will permit the

user to take advantage of the lightness and strength of aluminum practically without restriction as to finish. This may be an important stimulus to the use of aluminum die castings which have, in the past, been held back by the limits in the range of finishes applicable.

Another important operating advantage effected by this process is the practicability of soldering nickel plated aluminum articles, whereas formerly, the bare aluminum could not be joined by this method.

These few examples illustrate the fact that a finish may add intrinsic value to a product by improving its operation under service conditions, by

lengthening its life and also by the indirect, though important, method of inducing better care in its handling. In many cases such a finish may add a little to the cost. But, if the light of the improvement is not hidden under a bushel; if it is made clearly evident by, at the same time, enhancing the appearance of the product, it will not only justify a slightly higher price but will also make the better price obtainable.

Lowering the Cost

It is a truism that by the use of special metals or alloys almost any desired properties can be obtained. But this practice is necessarily limited by

economic factors. Hardware made of 14K gold would be beautiful and would last forever, but no one could afford to buy it. Similarly (for a more rational example), lighting fixtures of solid bronze have permanency and beauty but also a comparatively narrow market. Consequently, most cast lighting fixtures are made of the 95 zinc, 5 aluminum alloy, cast in slush molds, plated and colored in

thousands of varieties. They are low in price but they are fully as good for the purpose as the most expensive materials. Moreover, their beauty residing in the design and the surface, may be just as great as if they had been made of gold. So there is no bad taste attached to the use of cheap base materials; there is only good sense.

Cost reduction through special

metal finishes is, therefore, effected by the use of an inexpensive base and improving the surface by special treatment or covering it with a thin coat of the more expensive material which has the better properties desired. This coating may take the form of plating in any of a large variety of metals and colored or oxidized finishes; it may be a lacquer, a lacquer enamel or a synthetic coating in any of literal-

AT RIGHT

BEAUTY of design and finish with inexpensive materials. This lighting fixture is made to a large extent of "durable" metal (zinc 95, aluminum 5) plated and finished. Photo from Lightolier Co.

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BELOW

IMPROVEMENT of a steel base by superimposing a surface material. This is an installation of Robertson Bonded Metal (with walnut veneer surface), used to panel the library of the Eye and Ear Hospital, Pittsburgh. The composite consists of steel, cloth and wood, permanently fused together. The steel core sheet is coated with a soft metal, of low melting point, after which a layer of cloth is fused to the sheet by means of heat and pressure. Tiny "teeth" of metal penetrate and interlock with the cloth fibres. The wood veneer is applied with a phenolic resin adhesive to the cloth. The complete assembly can be cut, stamped, bent or subjected to mild drawing.



ly hundreds of designs and colors; it may even be a very inexpensive finish like lithographing. In many cases also, it is possible to use pre-plated sheet and strip metal which already has the desired surface, requiring little or no finishing work on the fabricated article.

In comparing the cost of bare and specially finished metals, it must be borne in mind that even the "stainless" or corrosion resistant metals require polishing to be presentable for consumer use, and that polishing is the most expensive operation in the metal finishing cycle. Coatings, electrodeposited, sprayed, dipped, brushed, etc., and surface treatments are generally cheap and easily applied (except in the cases of the precious metals and perhaps isolated examples of special enamels or lacquers in which special accounting must be made for the cost of materials).

The lighting fixture mentioned previously is only one example of the use of a cheap basis metal which, together with the finish, costs less than an expensive basis metal. Another is illustrated by the classic story of the automobile manufacturer, who, in the days when cars had prominent radiator shells, balanced the cost of polished stainless steel versus cold rolled

steel plus a copper-nickel-chromium plate, and found that the plated shell would cost him about \$2.40 less. (He then chose stainless steel—no doubt for perfectly valid reasons of his own—but that is another story!)

Another literally shining example is the light reflector. The first prerequisite is a material with high reflectivity. Other requirements are permanency, freedom from tarnish, long life and perhaps above all, since they are used in such huge quantities, reasonable cost. Using fine expensive materials, the manufacturer restricts these materials to the surface of his reflector. And although he may use porcelain enamel or Alzak or silver or even rhodium, by using a cheap basis metal and restricting the expensive material to a very thin surface finish coat, he can produce a fine, serviceable, high quality product at a reasonable price.

A hidden but nevertheless present factor in reducing the cost of manufacture resides in the practicability of producing a wide variety of appearances, colors and designs, with the minimum number of basis metals, perhaps only one, steel, thus keeping inventory down to the lowest figures.

Instances could be cited almost without end. All forms of plated

steel; all forms of protection against rust—chemical, paint, hot galvanizing, tinning, and lead coating; metal spraying, sherardizing, rubber coating, etc., are methods of using a cheap basis metal and coating it with a material which has special properties suitable for special purposes—at a reduced cost of manufacture.

Briefly, therefore, the reasons for putting a special finish on metal products may be summarized as follows:

(A) To add value to the product because of (1) better operation in service; (2) longer life, or resistance to wear or corrosion or both; (3) improved appearance or improved style.

These factors apply not only to products for general public consumption, but also to industrial and utilitarian objects in which improved finishes would induce better care of the product or machine, and better operation, because of the pride of the operator in his machine or tool. The slight additional cost can easily be recovered in the sales price if the value is made evident by improved appearance.

(B) To lower the production cost by (1) the use of a cheap basis metal which, together with the finish, would cost less than an expensive basis metal alone.

40,000 lb. Unalloyed Gray Iron Developed by Pomona Pump Co.

AN unalloyed gray cast iron with a tensile strength of 40,000 lb. per sq. in. and a Brinell of 215 and highly resistant to the corrosive effects of most chemically active waters, has been developed by the Pomona Pump Co. of Pomona, Cal.

This iron, called Pomoloy, is cast on a production basis in the company's pump parts foundry and was developed to overcome the secondary corrosion frequently found in deep well pumps. It is characterized by a small, well dispersed, nodular graphite and is said to have excellent resistance to impact, shock and vibration. In the cast condition the iron has a smooth, close grained skin highly resistant to corrosion.

Pomoloy machines with a tough

cutting action, similar to malleable iron or steel, and the resultant surface is capable of being highly polished. The iron can be hardened by heat treatment or by the oxy-acetylene process.

Pomoloy cools at higher temperatures than ordinary cast iron and re-

quires modification of the usual gray iron gating and feeding practice.

The iron is produced in two grades—Pomoloy C-2 and Pomoloy C-3. Both these irons come under A.S.T.M. specification A48-36, the C-2 type falling in Class 40 and the C-3 in Class 50. Tests on the C-2 grade show a tensile strength in excess of 40,000 lb. per sq. in., a transverse test (1.20 in. round bar on 18 in. centers) of 2850 lb., a Brinell hardness of 215 and a deflection of over 0.24 in.

PHOTOGRAPH of a spring cut from a standard transverse test bar of Pomoloy, minus any special treatment, illustrates the resiliency and the high machineability of the iron. This cast iron spring can be bent into a U-shape and stretched or compressed and will resume its original shape.



POWERFUL SHEAR FOR U.S.S.R.

DESIGNED and built in the plant of the Thomas Machine Mfg. Co., Pittsburgh, a large plate shear, believed to be the world's largest, has been consigned to Machinimport in the U.S.S.R. for use in a Soviet plate mill.

Of cast steel construction throughout, the machine weighs nearly 500,000 lb., and has a capacity for shearing plates up to $2\frac{1}{2}$ in. thick by 162 in. wide at one stroke—shearing steel of 60,000 lb. per sq. in. tensile strength.

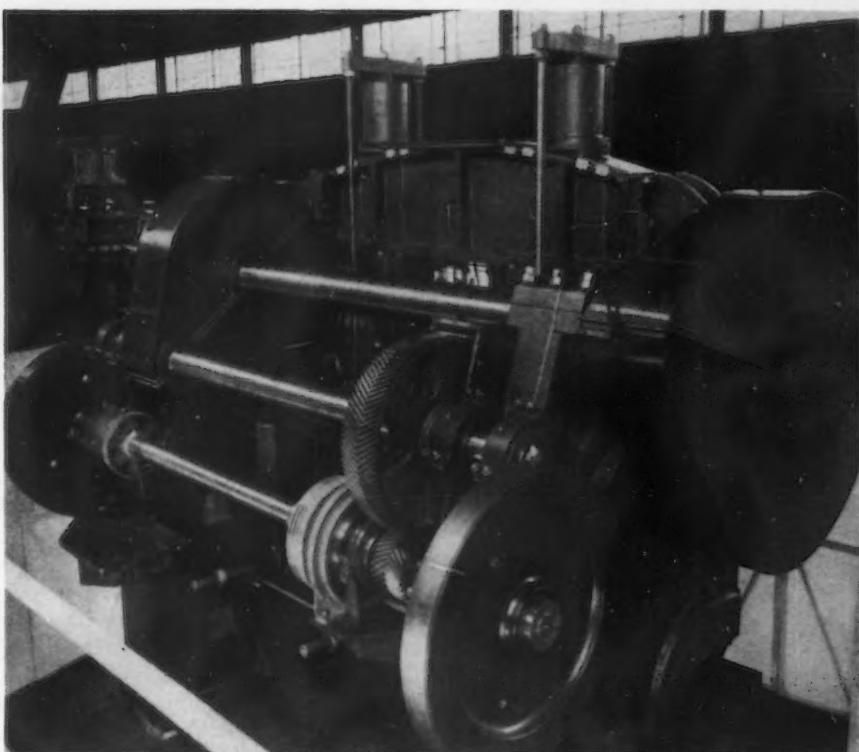
The main shaft is of alloy steel and is driven from both ends by means of herringbone gears, completely enclosed and running in oil.

The gear drive is operated by means of a magnetic clutch which is combined with the brake. This method of driving permits stopping the ram at any point of the stroke and also permits "inching" the ram down, as desired. By this method of driving, which is controlled by means of a push-button, only the flywheel shaft and the motor are running, when the machine is idling, the gear train being at rest.

The flywheel shaft is mounted on Timken bearings. The flywheels are made of steel slabs turned all over to insure perfect balancing. The ram is balanced by means of air cylinders. The holdown as shown on the accompanying photo is operated by air, but can also be controlled hydraulically. The operation of the holdown is synchronized with the movement of the ram.

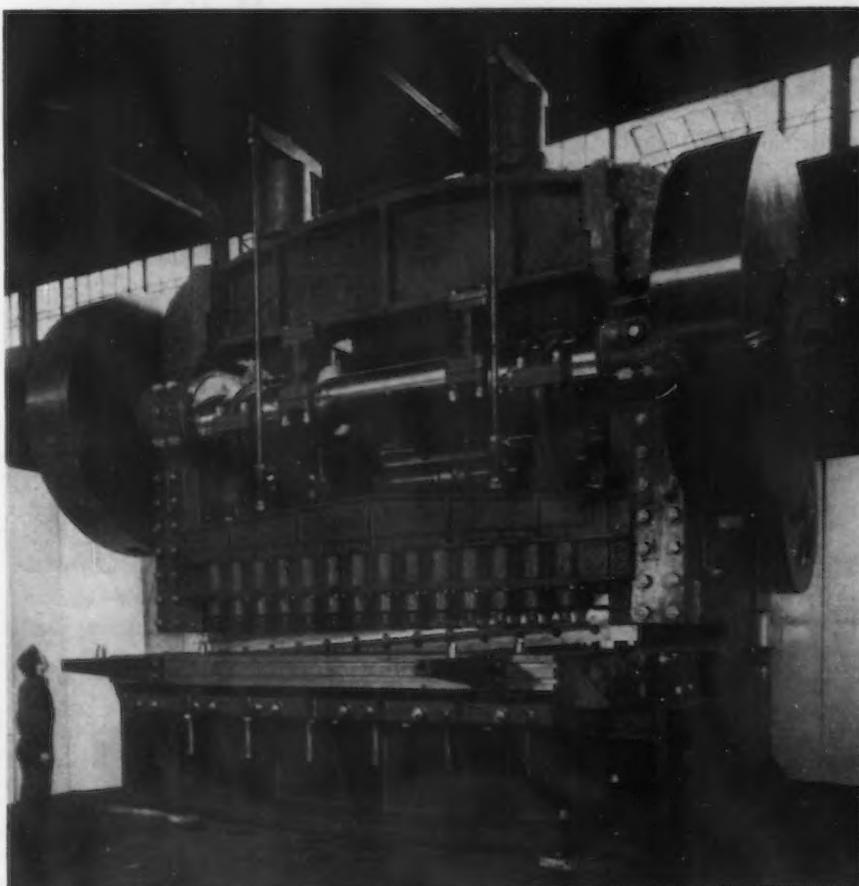
For handling heavy plates, casters mounted on springs are provided on the table of the machine. These casters are set to carry the material slightly above the lower knife.

The special feature on this machine is that the knife on the ram is so arranged that it can quickly be changed for splitting or slitting plates. In normal position, the machine will shear plates 162 in. wide. For shearing plates on a bevel up to 30 deg. there are provided raising and lowering screws, driven by motor which will permit setting the plate quickly to any desired angle.



THE gear drive is operated by a magnetic clutch. This method of driving permits the ram to be stopped at any point of the stroke, or it also permits "inching" the ram down.

FULL view of the plate shear. It weighs close to 500,000 lb. and has a capacity for shearing plates $2\frac{1}{2}$ in. thick by 162 in. wide.



Weir

HEADS STEEL

ERNEST T. WEIR, chairman of the National Steel Corp., was elected president of the American Iron and Steel Institute, succeeding Tom M. Girdler, chairman of the Republic Steel Corp., who had served two years. Two new vice-presidents were elected to succeed William A. Irvin and P. D. Block, who recently retired. They are Benjamin F. Fairless, president of the United States Steel Corp., and Frank Purnell, president of the Youngstown Sheet & Tube Co. As the presidency of the institute is now limited to one term of two years, the new vice-presidents, in turn, probably will succeed to the presidency after Mr. Weir's term.

The institute medal was presented to J. T. Whiting, president of the Alan Wood Steel Co., Conshohocken, Pa.

Attacks on the New Deal for its policies featured both the morning session and the banquet in the evening. Tom M. Girdler, whose address is published in this issue substantially in full, warned against continuation of excessive Government spending, high taxation and the Wagner Act in its present biased form. He declared that "the New Deal philosophy is producing poverty" by retarding normal industrial revival.

United States Senator Miller E. Tydings of Maryland, who was the principal speaker at the banquet, charged that the present policies of the New Deal are leading the country to "economic slavery." He presented an eight-point program for Government economy, business revival and general stabilization. He declared that "under the guise of improving the condition of the people, the National Government is actually squandering their substance and prolonging the misery of the masses."

Several references were made to the recent wave of price cutting on flat rolled products. Mr. Girdler said he hoped that last week's meeting would mark the beginning of more orderly marketing of steel.

At the morning session Benjamin F. Fairless read a paper on "Standard-

ization in the Steel Industry." Arthur Roeder, chairman of the Colorado Fuel & Iron Corp., who had prepared a paper on "The Management Factor in Labor Relations and Public Relations," was unable to deliver it in person because of illness. His paper was read by Walter S. Tower, executive secretary of the institute.

The afternoon technical session was under the chairmanship of Charles M. White, vice-president of Republic Steel Corp. The papers presented were as follows: "The Training of a Metallurgist," by Bradley Stoughton, Dean of Engineering of Lehigh University; "Problems in the Manufacture and Use of Steel Products in the United States," (abstracted in the May 25 is-

sue of *THE IRON AGE*) by James E. Lose, vice-president of Carnegie-Illinois Steel Corp., with a discussion by Quincy Bent, vice-president of Bethlehem Steel Co.; "The Manufacture, Sale and Use of Steel Products in Great Britain," by James Henderson, deputy-chairman of Appleby-Frodsham Steel Co., Ltd., London, England; "The Value of Electric Arc Welding in Design and its Limitations," by Isaac Harter, J. C. Hodge and Glen J. Schoessow, all of Babcock & Wilcox Co., with discussions by P. W. Snyder of the United States Navy, and S. C. Hollister, Dean of the College of Engineering of Cornell University. Copies of these papers may be obtained from the institute.

T. M. Girdler Discusses Effects of Political Events on Business

DESPITE the many problems which the steel industry, in common with all business, is facing, T. M. Girdler said in his address as president of the institute that he had not lost faith in the future of this country or in the future of the steel industry.

"We have had 10 years of depression and subnormal production, and I am convinced," he said, "the country is ready for a long period of replenishment, of rebuilding, and of expansion in which steel is ready to share. With at least some temporary abatement of the war scare in Europe, all that is needed to get industry under way is the removal of the brakes upon business expansion and employment.

"If that were done, I am convinced that the national income would speedily rise to more adequate levels. Only the people themselves can compel the changes necessary to restore prosperity and preserve the country's institutions. I believe their course is already decided, and it promises well for the ultimate future of America."

Answering the insinuations that have recently been heard that many

business men are "war mongers," Mr. Girdler said:

"The steel industry prays for peace for the world and above all for peace



BENJAMIN F. FAIRLESS

INSTITUTE...

for the United States. Some people believe that steel would profit greatly from war, and would welcome it. There is no basis for any such belief. War brings no real prosperity for the steel industry. Any temporary profits accruing from forced activity of plants during the World War were largely dissipated in the need to readjust the industry to peace time products and in the period of economic distress which was the aftermath of the war.

"Of course in the midst of a world that is arming to the teeth it is necessary for this country to provide for its own defense. But how much better it would be if Europe would solve its difficulties and turn the billions of dollars annually now being spent on arms into avenues of productive enterprise. The steel industry vastly prefers the making of plowshares rather than swords.

"Apparently there are some in this country who would send American soldiers to the battlefields of Europe, to help put down dictators and save the world for democracy all over again. I wonder if they have thought through



E. T. WEIR

to the consequences of our joining in another foreign war, particularly with the Government under the influence of the economic ideas now pervading it. As certain as night follows the day, while we were fighting to crush dictatorships abroad we would be entrenching one at home.

"Our participation in another World War would mean a death blow to individual freedom in the United States. Life would be rigorously regimented. Industry would lose the last vestige of private control. Labor would take orders from Government bureaucrats. And when the war ended those controls would not soon be lifted. The economic and political bankruptcy of the country would be complete. Perpetuation of dictatorship would appear as the only answer.

Road Leads to Dictatorship

"Even now in peace times while our Government berates the dictatorships abroad, it persists in domestic policies leading straight down the road to dictatorship in the United States. Many of the measures most open to attack under dictators have been adopted and are in full effect here. These measures not only are checking business expansion but they are carrying the United States rapidly toward a changed form of society, some variety of a collective state.



FRANK PURNELL

"Consider, for example, the rapidly pyramiding increase in the share of national income under control of the Government; the mounting Federal debt and deficit spending; the stifling of private enterprise by unsound taxation; the persecution of industry through unfair labor laws; the reckless interference with industry by regulatory commissions; and the evils of carelessly devised social security legislation.

"To this list might be added, among many others, both the open and veiled attacks upon the profit motive in business. Attack upon the profit motive comes from those who would destroy the profit system because it is essential to private enterprise which they would undermine or dominate. It comes from those who, living in a world apart from realities, have convinced themselves that a profit for industry comes only through exploitation of labor. It comes from those who for reasons of political opportunism would hold up profits as a flag to incite class hatreds.

"Some months ago the country was filled with talk of a changed front in Washington. The Administration was to start a great program of business cooperation—all aimed at restoring confidence, stimulating industry and trade, and increasing employment. Well, we are still waiting for it to

start. According to all reports there was a battle royal among the inner circle of the Palace guard, with the extreme left-wingers routing the moderates, and the cooperation program was cancelled.

"And now, according to all reports, another kind of program is being devised for industry by these same left-wingers. Having tied the victim hand and foot, knocked him to the ground and thrown a heavy weight on his chest, they accuse him of 'sulking' because he is not up and around as usual. It seems they are planning to prescribe a new assortment of stimulants all taken out of the same old bottle labeled 'deficit spending.' Apparently they are laboring under the hallucination that the expenditure of a few more billions will accomplish what the spending of 20 billion dollars had failed to do. (They are like some of the people in the steel industry who never learn anything by experience.)

"During the period of cooperative promises, the suggestion came to various industrialists to avoid public criticism of the Administration else the good work be hindered. That suggestion, I am sure, was heeded in good faith and in whole heart. I know of no responsible business man who would not gratefully welcome and co-operate to the fullest possible extent with any honest effort by Government to encourage private industry and stimulate private employment. But the feeling grows that there is in important places no sincere desire to lend such encouragement.

"Industry does not take issue with the Administration in any spirit of carping criticism or of personal bitterness. The opposition is to measures and policies which are clearly hurting business, preventing reemployment of jobless people and prolonging the period of economic stagnation. Naturally industry is impatient and critical of those whose objective appear to be not revival, not even honest reform, but ruin of the form of society in which we have lived.

"I hope the time will never come in America when citizens are not free to criticize policies of the Government with which they disagree. I believe that today, if never before, a serious obligation rests upon businessmen to speak out—to tell the truth without fear or hesitation about the policies which are hamstringing enterprise. To do that is not to make a political stump speech, because industry is not interested in party politics as such. Rather it is to make a plea for the survival

of American principles and American institutions."

Tax Burden Assailed

Criticizing the Government for the continuation of its policy of deficit spending, Mr. Girdler said that every intelligent person knows that "if the Government persists in its present mad financial course, it will surely lead to uncontrolled inflation and vast economic disaster. There are only two ways to avoid that disaster, either by drastic Government economies or adding some five billion dollars to the country's tax bill."

He added that any attempt to solve the problem by sharply increased taxes would "break the back of business." He cited that in 1938 the steel industry paid \$100,000,000 in taxes, which was approximately \$15,000,000 more than the industry earned before taxes. Of the total, nearly 80 per cent went to local tax collectors. Last year's tax bill for the steel industry, he said, was only 4 per cent less than that for 1929, although production was some 50 per cent less, and the earnings before taxes were 80 per cent less. The tax total last year was equivalent to \$254 for each wage earner attached to the industry and equal to more than \$5 for each ton of finished steel produced.

This situation, he added, is typical of many industries and supplies the answer to the question of whether industry is prepared to bear still greater tax burdens. "What a howl there would be from Governmental quarters," Mr. Girdler said, "if the price of all steel products were to be raised 25 cents per hundred pounds."

"The offending taxes could easily be removed. We have had the promise that constructive leadership in Congress would insist that corrective action be taken at this session, but powerful opposition to any relief is all too plainly evident. The reasoning of those who oppose these urgently needed tax reforms is not easy to follow, unless one is to conclude that they entertain no great concern for bringing about business revival."

Wagner Act Criticised

The Wagner Act was also criticized by Mr. Girdler as the most harmful "of all the monkey wrenches that have been thrown into the industrial machine." He added that the major contributions of that law and its administration by a biased board have been industrial confusion and demoralization.

"That act, as it now stands, is wholly one-sided and unfair. Promoted by its advocates as guaranteeing the collective bargaining rights of employees, its real result has been to advance the selfish interests of certain labor organizations. The welfare and the wishes of employees themselves have been secondary considerations in the administration of the law."

"The steel industry's position on the Wagner Act has frequently been misrepresented as being based on opposition to collective bargaining. As all of you well know, that is untrue. The fact is that collective bargaining is a long-established practice in the steel industry. I regard it as essential in the operation of modern industry. But one of the tragic results of the Wagner Act and its administration is that it has all but destroyed every semblance of collective bargaining in many units of the steel industry. Employees have been deprived of the collective bargaining plans which had served them well for many years, and the great majority have refused to be driven against their will into professional labor organizations. So in the case of many thousands of workers in the steel industry, they now have no effective form of collective bargaining whatsoever. Other thousands, of course, are carrying on collective bargaining through local independent unions."

"The steel industry does not seek the repeal of the Wagner Act nor any weakening of the rights of workers declared therein. Sound national policy unquestionably requires a labor law but it must be equitable in its provisions and in its administration to all classes and all groups. For my own part, I would welcome such a law for it would serve a constructive purpose and contribute to the public interest."

Expects Change in Policies

Notwithstanding his concern over some of the policies and measures of the Government which, in his belief, are obstructing the return of prosperity, Mr. Girdler said he believed that many of these objectionable policies will be changed. He believes that, he said, "because the pendulum of public support unmistakably is swinging away from them. There is abroad in the land the stirring of a great middle class revolt against crackpot schemes, radical legislation, ruinous extravagance, and the business baiting which have characterized our Government for the last six years."

He does not believe, however, that

the portents show any swing back to the so-called reactionary policies of the "good old days." "The hands of the clock," he added, "have moved forward and cannot be turned back. Any advance truly in the public interest will be safeguarded. No right thinking business man can reasonably object, for example, to fair and impartial Government regulations for industry wherever they may be required in the public interest. By government by bureaus, the straitjacketing of industry and daredevil financing have been steps backward and not forward."

He declared that "industry has the great obligation of making every possible contribution within its power to the solution of the national problems which are common to us all.

Steel Industry Should Solve its Own Problems

"The best and most effective contribution that could be made to the general situation by the steel industry would be for it to solve its own problems to the fullest extent possible under existing conditions. To accomplish that end the industry must recognize and accept as never before its obligations and responsibilities to its employees, to its stockholders, to its customers, and to the public at large. In order for the industry to thrive it is necessary to give balanced consideration to all of these. Labor must be well paid and enjoy favorable working conditions. But labor cannot reasonably expect to take all at the expense of the stockholders. Prices must be fair to customers and low enough to stimulate consumption, but they should not be so low as to deprive labor of a just wage, nor the stockholders of a reasonable return. The public interest cannot be overlooked under any circumstances.

"The record of progress in the industry affecting the welfare and interests of employees is one of great advances all along the line. In support of that I need only to refer to steel wage rates for common labor which in the span of my own experience have increased more than 400 per cent; to the work week which during that same period has declined from an average of 67 hours to a normal work week of 40 hours; to vacations with pay for wage earners which are generally in effect in the steel industry; and to the group insurance plans, which make it possible for many thousands of steel workers to acquire insurance at a low cost.

"These are only a few of the evidences of the improved and continually

improving status of the wage earners in the steel industry. They are evidences, moreover, of the high degree of economic responsibility that has been developed in the industry.

"Depressed conditions in the steel market unavoidably have affected em-



J. T. WHITING, president of the Alan Wood Steel Co., Conshohocken, Pa., was the recipient of the American Iron and Steel Institute medal for his paper read at the 1938 meeting on "Microscopic and Petrographic Studies of Blast Furnace Materials."

ployment totals but at no time in recent years has the number on the industry's payrolls declined in the same ratio as production. For example, from the peak of employment in 1937 to the bottom in 1938, production was down nearly 70 per cent while employment declined only a little over 30 per cent. If you look at the curve of numbers employed in the industry over the past six years you will discover that a measure of employment stability relative to fluctuations of production has been achieved.

"Does it lie within the power of the industry in any way to improve this tendency toward stability of income or employment? I believe that is a question deserving of the most serious and comprehensive study. Many people profess to believe or openly charge that the industry deliberately and concertedly shuts down production when demand falls off in order to hold up prices. All of us know, of course, that any such charge is absurd. We know that the sharp fluctuations in steel

production result from the inherent nature of the industry as a manufacturer of producer's goods and that its products are largely made on order to specification. When specifications stop coming to the mills the industry has no other course but to reduce its output. In general, it cannot pile up stocks in anticipation of future demand.

"Even if there were any assurance of future requirements there is not sufficient storing space in the industry to hold, for example, all the ingots and finished steel being turned out at the peak of operations in 1937. And the costs of handling would be staggering.

"These are some of the aspects of the problem which should be studied and if any practical solution emerges it would serve a useful purpose. In any event, the industry owes it to itself and to the public to get at all of the facts in this much misunderstood matter.

"I believe that the industry has a good record with respect to its obligations to labor. I also believe that its responsibilities to the consuming public have been discharged with equal credit.

"Clearly the industry has failed neither its employees nor its customers. But it has failed its stockholders. In 1938 it paid to the tax collector an amount double that disbursed to all of its more than half a million stockholders. Since 1909 the share of the steel sales dollar going to the stockholder in dividends has declined from 8 cents to 2½ cents. If we go back again to 1909 for comparison we find that stockholders then received 40 cents in dividends for each dollar in wages. In 1938 they received only 11 cents.

"Average annual earnings of the industry since 1930 have been only 1.2 per cent on invested capital. Rising costs of production, high taxes and inadequate price levels are the greedy trio which have swallowed up profits and sacked the shareholders' pockets. One steel company has calculated that had the wages and taxes paid by the industry in 1929 applied to the industry in 1938, the loss for the year of nearly \$15,000,000 would have been converted into a profit of \$166,000,000.

"Judging from the record the industry has become allergic to profits. To look at its performance you would think it had anticipated those who want the profit system abolished and for all practical purposes had established itself as the first great industry

devoted to the idea of production for use.

"The industry needs a clearer understanding of the vital necessity for profits. It needs to realize that there is no glory in getting mere tonnage if the business is taken at a loss. Without profits no industry can continue indefinitely to attract the capital requirements essential to its progress and well being.

Capital Investment Large

"In the steel industry capital requirements are exceedingly large. During the past 10 years expenditures for new plants and equipment have exceeded \$1,500,000,000. That amount has been used not only for the installation of new continuous strip mills at a cost of close to \$400,000,000, but for the rebuilding of blast furnaces and open hearths and for modernizing and providing new finishing capacity. Large provisions, moreover, must be made for depletion and depreciation.

"Consider, for example, the problem of depreciation of the continuous mill. Assuming 20 years as the period of depreciation, and that may prove far too long in the face of developments which may come, a sum of around \$20,000,000 must be provided each year. In addition, of course, there is the interest on investment.

"Various units in the industry are compelled to spend large sums to maintain their respective competitive positions and the industry as a whole must preserve the competitive position of steel against other products and other industries.

"How can the industry justify these great outlays and how can it continue to attract the capital to provide for future needs, unless it is able to earn a reasonable return on the capital which it already has and pay a fair return to investors?

Discusses Steel Prices

"Not all of the blame for poor earnings in the steel industry can be put on the New Deal or the international situation. Part of it rests squarely upon the industry itself. If we do some honest soul-searching we will find that a share of this trouble lies in our own policies and practices. True enough in recent years demand has been restricted, volumes have been unsatisfactory and the industry has suffered from the general condition of uncertainty and confusion, but none of these nor all of them combined justify prices for steel below the cost of production, or insufficient to yield a fair profit.

"The industry has seen its costs



JAMES HENDERSON, honorary treasurer of the (British) Iron and Steel Institute, represented that organization at the meeting of the American Iron and Steel Institute, and read a paper on "The Manufacture, Sale and Use of Steel Products in Great Britain." Mr. Henderson is deputy chairman of the Appleby-Frodingham Steel Co., Ltd., England.

mount higher and higher and grow ever more rigid. It has seen the break-even point soar like a rocket to around 50 per cent of capacity, the highest in history. It has seen the attempt by government to make wage rates fixed and inflexible. And what has the industry done to meet these situations? It has brought down prices.

"When prices are lowered in keeping with economies of production and to stimulate consumption, that is one thing. The result is of wholesome benefit to the national economy. But when prices are lowered in the face of high costs without stimulating the general use of steel, that is quite another. The result is a step backward for a great industry and a blow to the national economy. As we well know the major portion of orders received by the steel industry is accompanied by specifications for special requirements, making it impossible for steel ever to become a mass production industry in the same sense as other industries turning out millions of units of a single kind or style of product.

"I believe in the lowest possible price for steel consistent with quality and costs. Any industry as basic as steel would be in an utterly indefensible position if prices for its products

were exorbitant and its profits excessive.

"I regard as equally indefensible the industry's failure to earn a fair profit upon a fair volume of business.

"Steel should increase, and has increased at great cost, the efficiency of its methods and the quality of its products.

Blames Industry, Not Buyers

"Consumers have shared in these benefits and greatly expanded markets have resulted. That is exactly as it should be, but in the scramble for business in the hard years of the recent past, the industry has completely forgotten the existence of the stockholder—the owner of the business, whose savings gave it the breath of life. The industry has sold steel at cost or less than cost and actually passed on some of the cost of doing business to the stockholder.

"The fault lies not with buyers. They do not honestly object to fair prices. It lies entirely with the steel industry itself.

"In this connection there is a tradition in the industry which leads to no good. I refer to the practice of announcing price changes upward weeks in advance of the effective date, while price changes downward go into effect immediately.

"Advance notices for price increases frequently operate as an artificial stimulant upon demand. Buyers rush in or are encouraged to place tonnage as far ahead as possible at the currently low price. The result is a spurt in activities followed by a sharp decline which may have serious adverse effects upon general business conditions. It is a practice which should be ended.

"In meeting the obligation to the public in general, the industry has but one test to apply—are its policies in the public interest? It is not always easy to answer that question. In the minds of some there may even be haziness as to what is the public interest. With regard to its own affairs, I believe that the industry meets the test successfully in all respects except that of earning fair profits. It pays good wages and maintains good labor relations; it makes good steel and sells it at fair prices.

"But the steel industry must go even further than that. It must take an enlightened interest in public affairs. It is no longer possible for any industrial executive to think only in terms of his own company or his own industry. No company nor industry can live in a vacuum. Policies of govern-

ment and opinions of people are of direct concern to industry. By the same token the problems and welfare of industry are of direct concern to the government and to the people.

"The steel industry cannot afford to fail in keeping abreast of changing trends in a changing world. It must be ready to adapt itself to new conditions and to adopt new ideas when they appear to be sound and in accord with the general welfare. But this does not mean that the industry should permit itself to be stampeded by unfair and unsupported criticism into abandoning principles that are right and traditions that are sound. It is when criticism is constructive and when considerations of public interest are impelling that changes should be made.

Calls FTC Criticism Unfair

"The industry has had a recent example of the kind of unfair criticism to which it is often subjected in the Federal Trade Commission statement on the steel industry before the Temporary National Economic Committee. That document was a curious combination of innuendo, insinuations and outright misstatement. Most of the commission's fire was centered upon the long used basing point method of quoting prices, upon the abandonment of which the Commission professes to believe hangs the fate of America's survival as a democracy.

"The industry can face all of the commission's charges with complete composure, because there is no real foundation for any of them. But these charges and accusations should not go unanswered and at the proper time and place they must be answered fully and effectively.

"The commission's statement affords a striking illustration of the contrast between economic theories propounded in the cloistered halls of Washington and practical experience of those whose business it is to buy the steel which the industry produces. Nine out of every 10 steel buyers who answered a recent questionnaire put out by THE IRON AGE said that they disagreed with the commission's theories. That's the difference between theory and practical knowledge. When I have wanted to find out something about horses, I never yet have asked a professor of mathematics.

"The commission's report on the steel industry is merely symptomatic of the general economic and political philosophy hostile to all industry which has pervaded the government for six years. If the purpose has not been to wreck private enterprise and

establish some form of state capitalism, all the moves have been made precisely as if that had been the purpose. The result has been a chronic condition of industrial paralysis, a complete lack of business confidence, and idleness for billions of private capital.

"So long as there is idleness for billions of dollars there will be idleness for millions of men. The country's welfare depends upon the production of wealth. The New Deal philosophy is producing poverty. Prosperity can be attained only by more industrial activity and we can have greater industrial activity only by correction of the hindrances that are blocking enterprise, checking the expansion of employment and making business unprofitable, uncertain and even hazardous.

"What is needed is not merely the reform of this or that policy or measure, but a complete change of philosophy and viewpoint. The problems arising from the viewpoint now dominant in the Administration are famil-

iar to us all and any comment made here could not possibly add any new light.

"There is need, however, for us to remind ourselves repeatedly of the certain disaster toward which the nation is being led by forces now in control.

"If there be any who may have clung to the hope that our present Federal Administration was to give business any real cooperation or encouragement, surely he must by now be disillusioned.

"Apparently only one kind of cooperation is wanted with business, and that is the cooperation of complete submission to twisted economics and bureaucratic whims. It is the cooperation of the Lady and the Tiger, described so vividly in the limerick:

There was a young lady of Niger
Who smiled as she rode on a tiger
They returned from the ride
With the lady inside
And the smile on the face of the tiger."

B. F. Fairless Invites Elimination of Unnecessary Steel Sizes and Grades

THE steel industry was urged to take stock of what it is producing and determine whether its unnecessary items are "distracting attention," in an address by Benjamin F. Fairless.

Inviting the industry to work for still greater standardization, the United States Steel Corp. president told the American Iron and Steel Institute general meeting that the institute is taking steps in that direction.

Already, he said, the technical committee of the institute is preparing a manual which will (1) classify and define the products of the iron and steel industry, (2) collect and present data pertaining to manufacturing tolerances, (3) collect information relative to methods of inspection for each product, and (4) review existing specifications that might be considered acceptable to industry as standard in their respective classes.

Perhaps a Housecleaning

"If a superfluity of grades is found to exist, along with whimsical variations in products, a good housecleaning is in order," the United States Steel leader said. "Additional measures of standardization, properly supported, undoubtedly will be found advantageous."

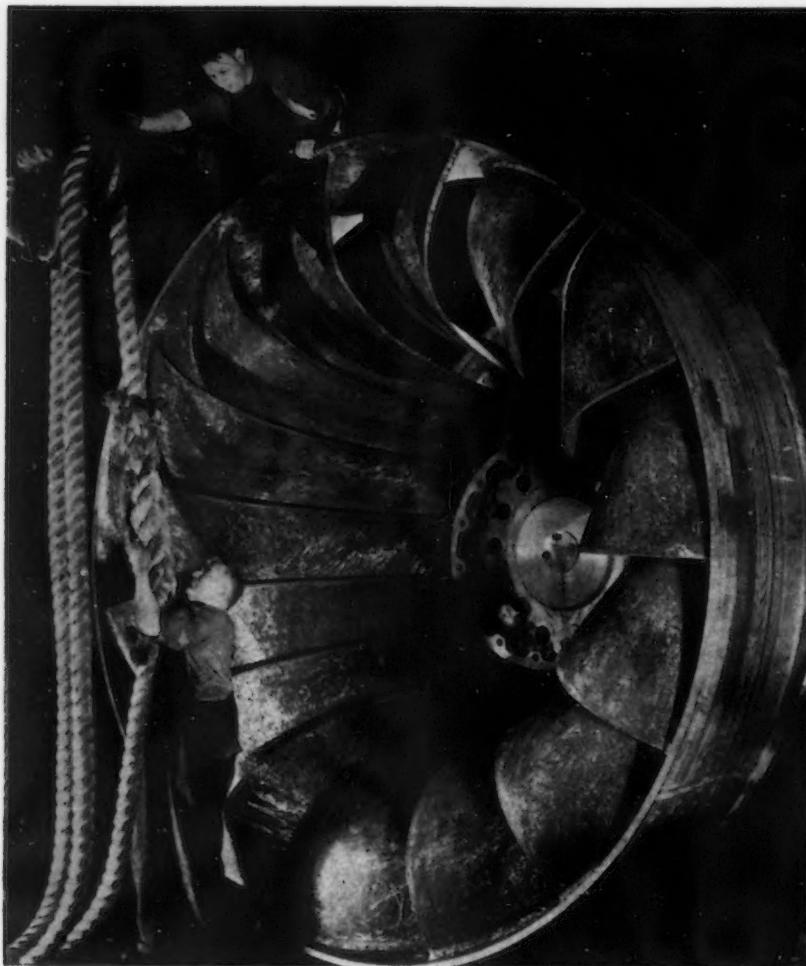
He pointed out that unnecessary diversification of steel products "walks hand in hand with small orders" and reminded his audience that standardization "is at work today in most of the industries" in the United States.

"Many persons," he said, "fail to realize the extent to which standardization has been applied thus far and do not appreciate the influence it is exerting upon the American standard of living. We see its results every day, yet rarely think of how they were accomplished, nor consider the part played by our manufacturers, technical societies, and trade associations in attaining the present position without at the same time interfering with initiative or retarding technical progress.

Consider the Telephone

"The citation of a variety of evidence may be of interest here. Consider, for example, the benefits accruing from the standardization of railroad track gages, the safety now assured by the standardization of air brakes and of draw-bar heights. In quite a different field, means of communication are highly standardized, but still are constantly being improved. At the same time, their cost to the user is decreasing. Thanks to standardization, almost

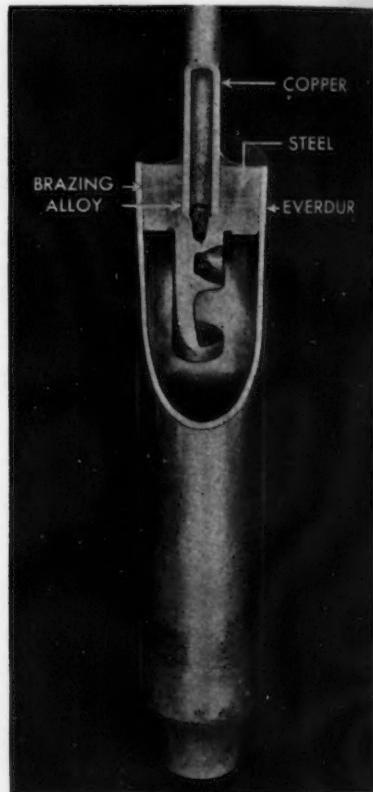
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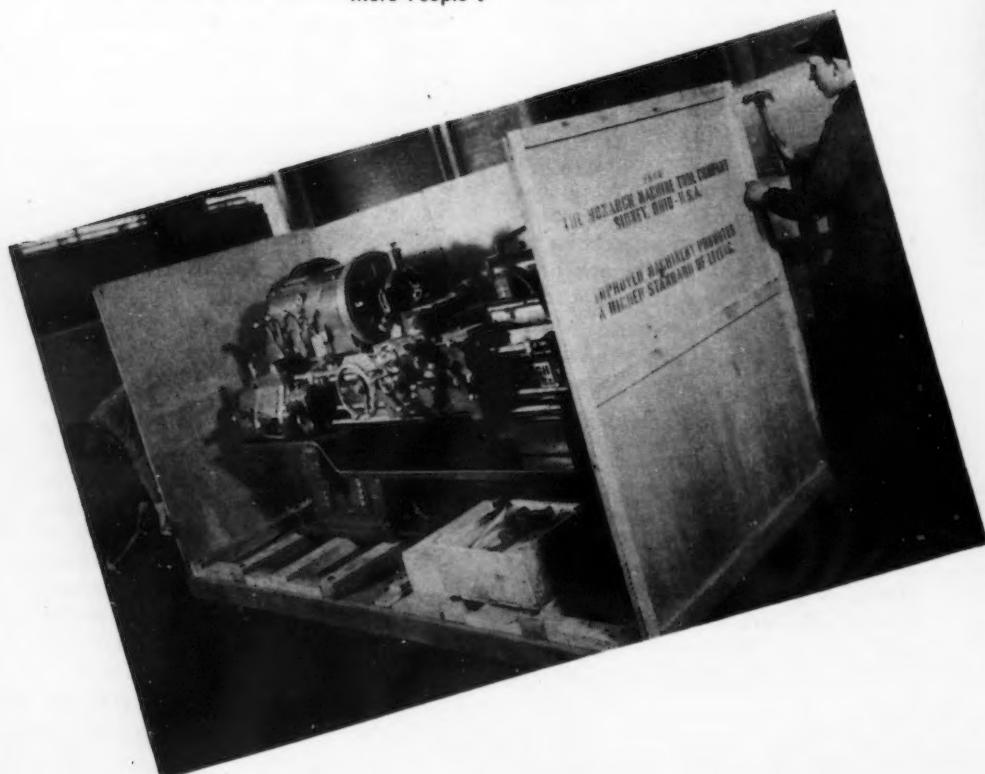
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TWO new 26,000 hp. hydraulic turbines, designed and built by Allis-Chalmers Mfg. Co., were recently installed by Appalachian Electric Co. for its 110-ft. head Clayton development on the New River near Miles, Va. The massive vanes of one rotating element are shown here, prior to final finishing and machining. Each complete turbine weighs 500,000 lb., and operates at 138 r.p.m.



BELOW

MONARCH Machine Tool Co., Sidney, Ohio, now ships lathes completely inclosed in plywood boxes instead of in conventional open crating. There is thus no damage by dust and dirt to bright parts protected only by a slushing compound or waterproof wrappings. Monarch also gets across messages to buyers, by stenciling on the box such slogans as "Improved Machinery Promotes a Higher Standard of Living," and "Another Machine to Make More Goods for More People".

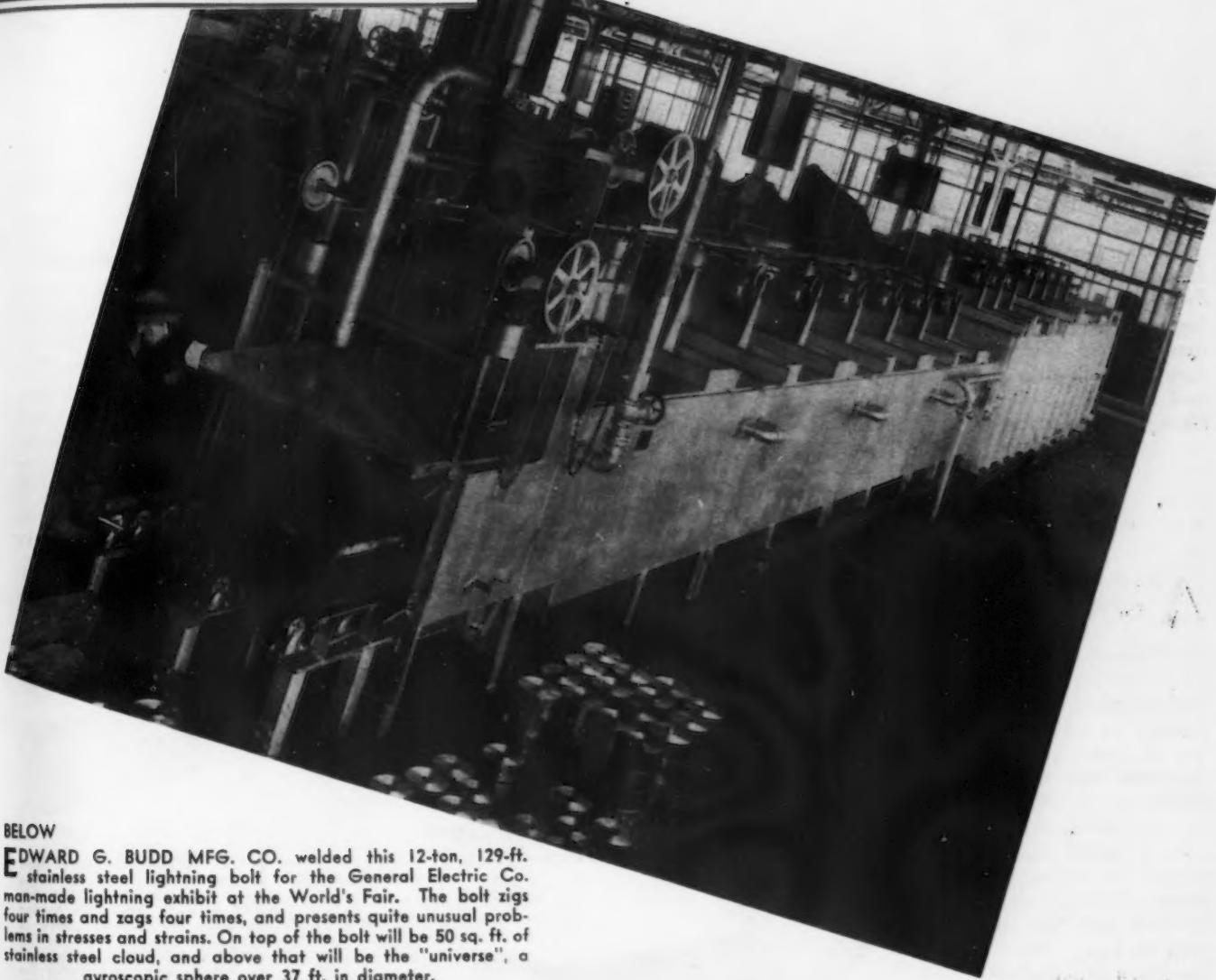


ABOVE

THIS cut-away section of an electric refrigerator part made up from Everdur, steel, and copper illustrates the reliability and adaptability of low temperature silver brazing in joining dissimilar metals. The outer shell of Everdur is brazed, at 1175 deg. F. with Easy-Flo, made by Handy & Harmon, to a steel center section which at the same time is joined to a copper tube.

New!

THIS new Westinghouse electric furnace bright anneals copper strip, and uses one of the company's new type of hydrogen generator to furnish inert gas. The furnace is a return recuperative type in which the entering copper absorbs some heat in passing the returning hot annealed copper, thus effecting high economies.



BELOW

EDWARD G. BUDD MFG. CO. welded this 12-ton, 129-ft. stainless steel lightning bolt for the General Electric Co. man-made lightning exhibit at the World's Fair. The bolt zigs four times and zags four times, and presents quite unusual problems in stresses and strains. On top of the bolt will be 50 sq. ft. of stainless steel cloud, and above that will be the "universe", a gyroscopic sphere over 37 ft. in diameter.



New Designs in Fixtures, Tools, Portable

A NEW collet index fixture of universal type is being offered, also a line of master collets for screw machines. Universal features are also found in a small lathe tool holder. Two companies have introduced torque indicating wrenches. Miscellaneous items illustrated include rotary files, flexible shaft equipment and stamping and marking devices. New portable electrical tool designs

include drills, hammers and saws. Two diametrically opposed principles of operation are found in involute gear testers placed on the market almost simultaneously. Other measuring apparatus includes a microscope for measuring the depth of surface scratches on work and extremely sensitive light wave apparatus for checking precision gages.

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diameter. The knurled tailstock knob is $1\frac{1}{2}$ in. in diameter.

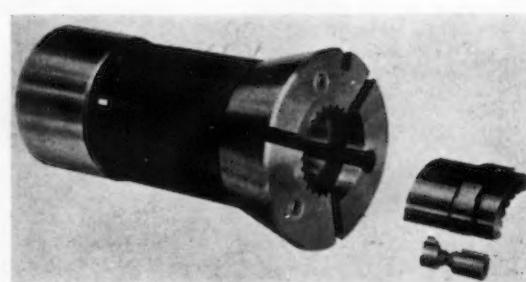
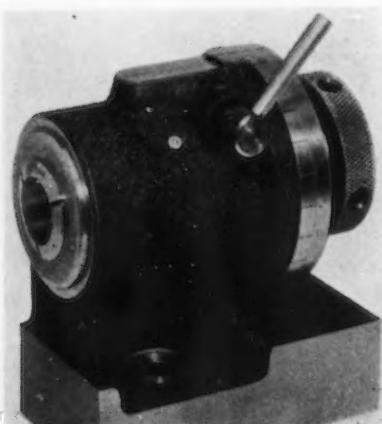
Master Collets for Automatics

A NEW design of master collet in which the pads may be changed without removing the collet from the machine spindle is being offered by Morrison Machine Products division of Hardinge Brothers, Inc. The pads are in three sections and each sector is locked in the collet by a single set screw with right and left hand threads operating jaws for a dovetail grip on the pad. The lock centrally draws the outside diameter of the pad firmly against the inside diameter of the col-

A COLLET index fixture suitable for application to miller, grinder, or shaper work has just been placed on the market by Hardinge Brothers, Inc., Elmira, N. Y. The standard model has 1-in. capacity through the collet, and the index plate has 24 holes, although many other variations may be had. This index fixture can be held in a machine vise, on a magnetic chuck or bolted to the table T-slot of any machine. It may be used for milling keyways, punches, pinions, flutes in end mills, taps, counterbores and for cutting gear and sprocket teeth. It is also useful for many tool grinding operations.

The fixture can be purchased separately as shown or with a sub-base and tailstock for holding work be-

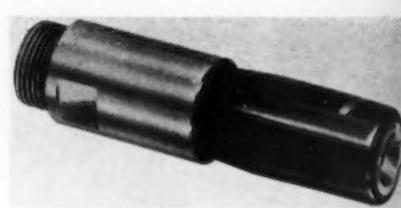
tween centers. The sub-base has a working surface of $21 \times 2\frac{13}{16}$ in., $1\frac{1}{4}$ in. from the flat bottom. Maximum center distance is 12 in. between collet and tailstock. Collet fixture has an accurately fitted, hardened and ground tapered spindle, and there is a hardened thrust washer back of the shoulder on the front of the spindle for the usual adjustment. The hardened index pin is lever operated. Draw spindle knurled handle is $2\frac{1}{2}$ in. in



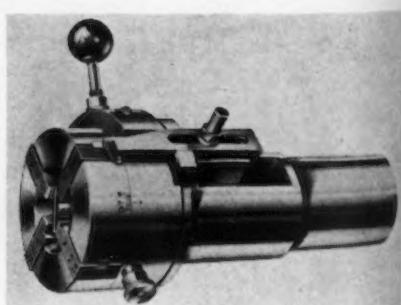
ABOVE
INTERCHANGEABLE pads are now provided on the master collets made by Morrison Machine Products, Inc., Elmira, N. Y., and the pads may be changed without removing the collet from the screw machine.

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AT LEFT
THE new Hardinge collet index fixture can also be supplied with tailstock and sub-base.



ABOVE
STYLE B Morrison master feed fingers for Brown & Sharpe screw machines have been modified with an adjustable tension feature. The outside sleeve is moved forward to increase the tension and backward to decrease it. This is done by gripping the two front jaws in a vise and turning the sleeve by hand or wrench. Interchangeable, split pads are used in the front of the finger for various diameters of stock.



BETWEEN
GEOMETRIC style CT taper cutting die head is made in nine stock sizes to cut $\frac{1}{8}$ to 5-in. pipe, or threading from $\frac{1}{4}$ to 6 in. large end diameters. Taper is controlled by a positive com-

Power Tools and Measuring Apparatus

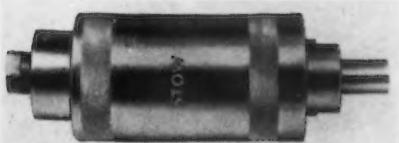
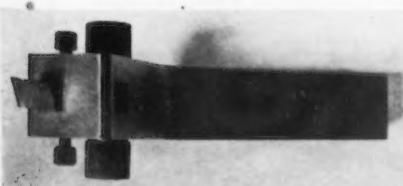
jet. The threaded double clamp arrangement is self-locking to assure the same position until removed by means of a socket wrench. A ground shoulder on the pad fits into a ground groove in the collet, eliminating endwise movement. The locking member remains in the collet face when changing pads.

Taper Cutting Die Head

A POSITIVE cam type, stationary die head for cutting taper threads on hand operated screw machines and turret lathes has recently been announced by the *Geometric Tool Co.*, New Haven, Conn. Some of the features of this style CT die head stressed by the maker are: better controlled accuracy; less power required



ABOVE
E LK universal tool holder with bit held in position for cutting thread (upper). Lower view shows features of tool holder that permit it to be used for facing, turning, boring, or cutting-off operations.



ABOVE
THIS handpiece converts the rotary motion of the flexible shaft into reciprocating action of 1-in. stroke. Files and saw blades with $\frac{1}{4}$ -in. shank can be inserted in the handpiece. Designed for speeds not exceeding 1000 r.p.m. This is a product of the Stow Mfg. Co., Binghamton, N. Y.

By FRANK J. OLIVER
Associate Editor, The Iron Age

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since the chamfer and the first full tooth back of the chamfer do all the work, instead of all teeth working as in the jam cut method; greater lengths of taper can be cut without the use of projection chasers; and steeper tapers can be cut with less danger of chaser breakage on tough materials. The tools themselves are made of special alloy steels. They may be used either as inside trip die heads or as outside trip types.

Universal Lathe Tool Holder

EITHER right or left hand facing cuts, as well as turning or threading cuts close to a shoulder or collar

can be handled on a lathe with a single universal tool holder recently introduced by the *Elk Machine Tool Works*, 33 West 60th Street, New York. The holder has two tool bit openings broached at right angles to each other, and the tool bit is simply pushed into either one until the cutting end projects the desired amount. A slight turn of the knurled head of the clamping device locks the bit securely in place, and the thrust on the tool resulting from the cut serves to lock it more securely. This tool bit clamping device has a knurled head on both sides of the holder for convenience. Exact centering or adjusting of the tool up or down as required in threading and cutting off operations is obtained by adjusting a second, smaller knurled head screw.

The holder pictured is broached to



ABOVE
DEFLECTION of the spring steel shaft is the simple principle of operation of the No. 56 torque indicating wrench, recently placed on the market by Bonney Forge & Tool Works, Allentown, Pa. A scale accurately calibrated from 0 to 200 ft.-lb. is placed on the shaft near the handle grip and moves under the pointer as pull is exerted on the shaft. Head is equipped with $\frac{1}{2}$ -in. square adapter and can be used with all $\frac{1}{2}$ -in. square drive sockets and attachments. Weight 3 lb.; overall length 23 in.

AT LEFT
NO. 5-57 torque Measuring wrench, made by J. H. Williams & Co., 225 Lafayette Street, New York, has a calibrated scale and index pointer showing applied turning effort from 20 to 200 ft.-lb. The wrench may also be set to give a sharp sound at any given torque. The tool is a reversible ratchet type, although it reads only right-hand torque. Handle is $1\frac{1}{2}$ in. long for ample leverage. Parts are of alloy, high tensile steel, finished in chrome plate.



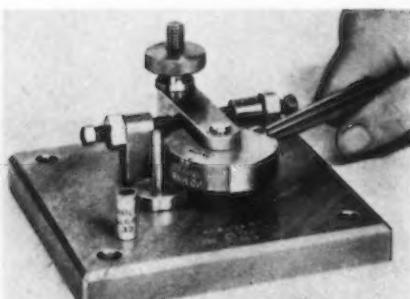
ABOVE
A NEW safety steel stamp holder for marking large size tubes and other round material, either in the hot or cold state, is announced by M. E. Cunningham Co., 101 E. Carson Street, Pittsburgh. Holding mechanism is of the friction type. One stamp may be pushed out while the other is inserted, thus speeding up changes. The curved grip enables the operator to clamp the holder firmly in place, assuring the alignment of the characters. The holder is available in sizes and shapes for holding a wide number of stamps, depending upon the diameter of the stock and size of character.

TO its regular line of hand cut and milled cut rotary files, the *Grobet File Corp. of America*, 3 Park Place, New York, has added a complete line of rotary files ground from the solid after hardening. Made of super high speed steel, they can be resharpened many times at low cost.



AT LEFT

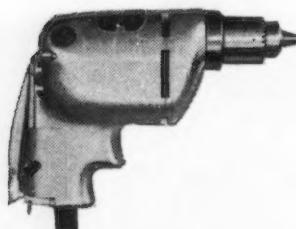
FOUR models of Red Devil demagnetizers and electric etchers are being offered by the Grinding Machinery Co., 2832 E. Grand Boulevard, Detroit. Reading from left to right: Etcher alone; combination demagnetizer and etcher, both bench models; portable demagnetizer; and bench demagnetizer. Three adjustments are provided on the combination unit to vary the depth of etch, and two adjustments on the etcher unit alone. For the demagnetizers, a quick acting switch is provided for control and for magnetizing parts by flipping switch off when the part is on the poles. Made for 60-cycle, 120 volt a.c. circuits.



HOLLOW parts up to 1 1/2 in. in diameter in steel, non-ferrous materials and the plastics can be marked with this hand actuated machine, made by H. O. Bates, 251 N. Broad Street, Elizabeth, N. J. The standard machine requires a hole in the center of the tube or part of 1/8 in. or more, depending upon the hardness of the material. Circumference of marking limit is 1 1/4 in. For marking solid cylindrical pieces, the part is dropped against two rollers which allow the part to rotate as the marking die impresses the mark. In the standard unit pictured, the operation is accomplished by dropping the piece onto the arbor and marking it by a swing of the hand lever. The same firm has also developed a new name plate stamping machine.



THOR Drillmaster 1/4-in. electric drill is a light duty tool, designed for intermittent service in maintenance and installation work. Weighs 4 lb. and is 12 in. in overall length. Free speed is 2000 r.p.m. Oilless bearings and alloy steel gears cushion shock loads and provide quiet operation. Field case, gear case and handle are die-cast aluminum. Made by Independent Pneumatic Tool Co., 600 West Jackson Boulevard, Chicago.



THIS compact 3/16-in. Hornet drill is said to be extremely light in weight and has the power and endurance for continuous production work. It has been designed for aircraft and light industrial work by the Van Dorn Electric Tool Co., Towson, Md.

fit 3/8-in. square bits. Round bits can also be used in this holder and either round or square 5/16-in. bits by employing shims. A smaller size holder is also made specifically for use with 5/16-in. bits. Holders are drop forged and heat treated to give maximum strength. They can be supplied with a set of six or more high speed steel tool bits for performing such operations as rough and finish turning, facing, cutting off, boring and internal and external threading.

Cast High Speed Steels

A RECENT bulletin issued by the Gorham Tool Co., 14,400 Woodrow Wilson Avenue, Detroit, calls attention to the place of cast high speed steels in between the fields covered by the forged grades and the cemented carbides. Under average conditions, the cast material will perform satisfactorily at surface speeds up to twice those possible with the forged. Gorham cast high speed steel is said to have unusual red hardness and wear resistance. It can be heat treated to any desired hardness from 60 to 72 C Rockwell.

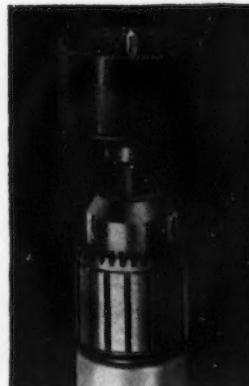
The process of casting high speed steel directly into tool blanks is adaptable to any size or shape of tool that may be furnished of forged high speed steel. The only exceptions are extremely small or thin tools that are difficult to cast economically and some types of cutting tools with radial cutting faces so long that it is impossible to maintain sufficient alloy density along the entire cutting face. The cast tools will stand severe shock conditions. In the annealed form they are readily machineable, but generally form tools are directly cast to shape and merely ground to finish form.

Involute Gear Checkers

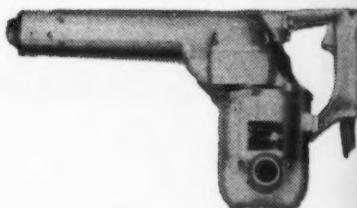
TWO new types of machines for checking involute profiles on gears have been announced in recent weeks. In the improved unit made by the Michigan Tool Co., Detroit, the indicating head of the involute checker uses a master rack tooth of selected pressure angle instead of the conventional pointer. Since involute forms are generated from a base diameter,



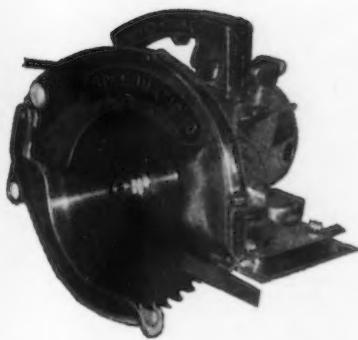
THE Black & Decker 5/16-in. Utility drill is intended for general maintenance work in industrial plants. It has a no-load speed of 1100 r.p.m., and carries splined gear mounting on spindle, ball bearings throughout, and a universal motor of ample capacity for general drilling. Van Dorn Electric Tool Co. is also marketing a 5/16-in. Utility drill of comparable specifications.



KILSAW, Inc., Chicago, is now marketing a line of hole saws made of 18 per cent tungsten high speed steel. They come in sizes from 1/4 to 3/2 in. and can be used with electric drills of 1/2-in. capacity or larger for cutting holes in sheet metal, cast iron and various composition materials.



FASTER drilling capacity and longer life of parts is claimed for the redesigned No. 34 portable electric hammer, recently announced by the Black & Decker Mfg. Co., Towson, Md. Weighing 17 lb., the tool develops 2300 blows per min. and has a capacity in concrete or brick of 1 1/2 in. Action is developed by an oscillating weight and spring assembly, the weight being driven indirectly by a crank. The universal motor is mounted at right angles to the barrel and operates through a train of reducing gears. The action is characterized by a definite follow-through stroke, producing a high ratio of efficiency. Such a tool has many uses, including caulking of tanks and removal of scale. A more powerful model, No. 36, is also made, with capacity of 2 in. in concrete and a speed of 1950 blows per min.



ATEST of the line of Speedmatic saws made by the Porter-Cable Machine Co., Syracuse, N. Y., is this 10-in. model, with a cutting capacity of $3\frac{1}{4}$ in. Helical cut gears are used to drive the spindle at 4000 r.p.m. Handle is placed directly above the cutting point and blade is in line with the operator's eye in the normal position. A large base or shoe contacts the work. Adjustments for cutting to depth or to any angle have been improved. A rip gage is provided that can be turned up out of the way when not in use.

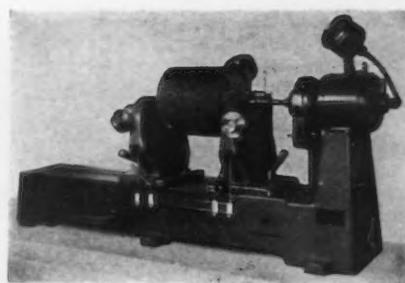
the tangential movement of the rack tooth with relation to the gear is directionally proportional to the angular rotation of the gear. The actual amount of movement depends upon the base diameter of the gear and pressure angle of the rack. Setting of the sine bar of the machine to provide the correct amount of movement is determined by simple calculation. Accurate adjustment of the depth of the rack tooth is not necessary.

This Michigan Tool involute checker is provided with a full master base circle integral with the work holding

spindle. The sine bar acts as a compensator for differences between length of arc of the master disk and the base circle of the gear being checked, and it is now mounted on a carriage moved by a lead screw. A single eccentric clamp is provided on the tailstock for rapid set-up of different lengths of arbors.

IN the No. 6M involute measuring machine made by the *Fellows Gear Shaper Co.*, Springfield, Vt., a master involute cam is employed in place of base circles and a sine bar. The master involute cam is developed from a base circle greater than the maximum capacity of the machine (6 in. p.d.), and for checking smaller base radii, it is only necessary to change the radial distance of the pointer relative to the axis of the gear. The rate of travel of the slide carrying the indicator is then changed automatically to agree with the base radius setting. Location of the pointer at the correct base circle radius is done by setting the position of the main slide with standard size blocks in a direction radial to the gear blank. Setting of the pointer at the correct starting position of the involute is done by means of a second set of size blocks between a button and an auxiliary slide at right angles to the main slide and tangential to the base circle.

The holder that carries the pointer is mounted on this second slide. The

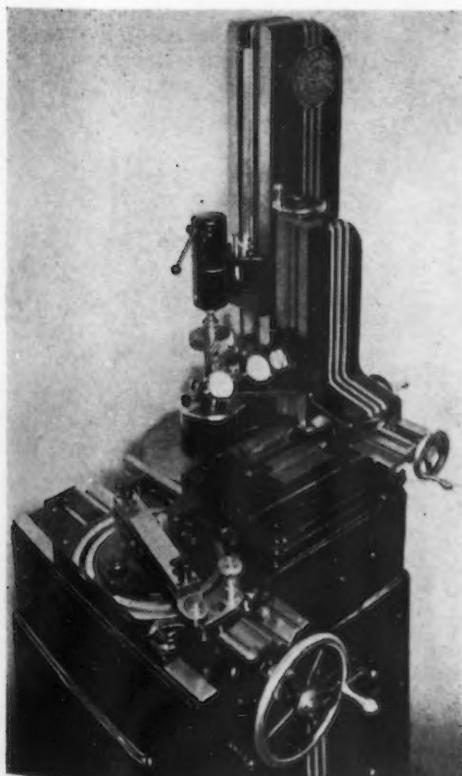


GLOBE size No. NE-1 Equipose dynamic balancing machine will take weights from 1 to 25 lb. and 15 in. swing. To the features of the standard N series machines have been added a supersensitive Neon Equipose dynamic balancer, the purpose of which is to completely neutralize any unbalance in any selected plane and give a very close reading as to angle and amount of unbalance in the second correction plane. The bearing cradles are kept as light as possible to minimize their inertia effects. Other sizes with this feature are made to balance rotors weighing from a few ounces up to 14,000 lb.

pointer itself is carried on a vertical bar, permitting it to be moved up and down for measuring various gears in a cluster without disturbing the gear set-up. In case it is desired to measure a modification of the involute, a dial indicator on the slide measures the amount of modification and a graduated dial on the work arbor base measures the angles through which it is modified.

Wear Resistant Material for Gages

PATENT No. 2,147,329 has recently been granted Fay H. Willey of *Willey's Carbide Tool Co.*, 1340 W.

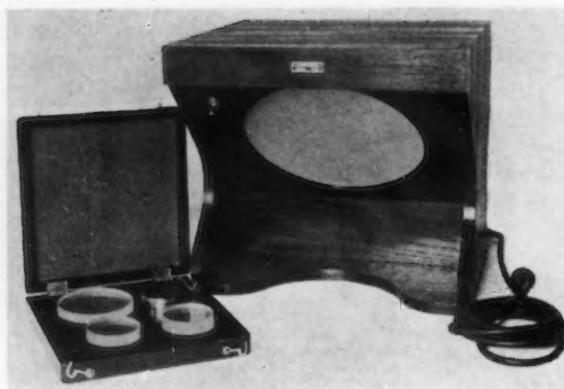


AT LEFT
MICHIGAN TOOL CO.'S new involute gear checker uses a master rack tooth to contact the gear tooth instead of the conventional pointer. Illustrated is the high column model designed to take care of gears ranging up to 26 in. between centers.

• • •

AT RIGHT
SETTING the involute pointer in the radial or starting position by means of a size block between the end of the auxiliary slide and a button on Fellows new model No. 6M involute profile measuring machine. Machine will check gears up to 6 in. pitch diameter and the indicator pointer holder has a vertical movement of $3\frac{1}{2}$ in. for cluster work, such as shown.





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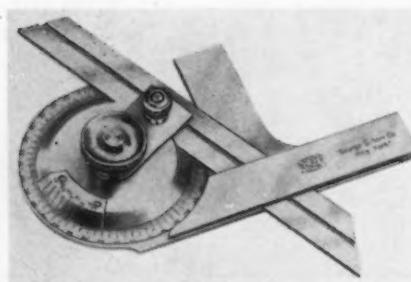
AT LEFT

IMPROVEMENTS in the Van Keuren light wave equipment include a source of monochromatic light (one wave length or color) and a set of optical flats ground to 100 per cent greater accuracy than in the past. The equipment compares gage blocks in millionths of an inch deviation from standard.

• • •

Vernor Highway, Detroit, for a tungsten carbide wear resistant material suitable for plug and external gages, lathe centers, rest plates and the like. Tungsten carbide containing 6 per cent carbon is the base metal and provides the desired hardness and resistance to wear. It is present in proportions from 76 to 87 per cent. Nickel in the range of 20 to 9 per cent (hard to hardest alloys) is used as a binding element, and about 2.8 per cent molybdenum is added to give the necessary toughness and tensile strength. About 1 per cent chromium is introduced as a deoxidizer. A small percentage of titanium is used to increase the hardness and antimony is used to reduce the temperature of the alloying point. Boron, silicon, tantalum, vanadium or zirconium are also used in varying proportions to increase the density and hardness.

The materials are mixed in finely divided form, are compressed into blanks under pressure varying from 10,000 to 20,000 lb. per sq. in. as the temperature is progressively raised from 900 to 1750 deg. C. The pressure is increased in steps, allowing for cooling of the blank and escape of the gases between stages. It is



A VERNIER giving readings within 5 min. of arc is provided on the new Mauser universal bevel protractor, being sold through George Scher Co., Inc., 128 Lafayette Street, New York. Dial is graduated in four 90-deg. quadrants and graduations are finely etched with black markings. The tool may be obtained with 6, 8 or 12-in. blades, beveled at each end to 45 and 60 deg. respectively. Independent thumb nuts are provided for dial and blade.

claimed that these steps of heating under pressure and cooling in succession are productive of greater density of the mass than any alloy additions might contribute.

Light Wave Comparator Equipment

SEVERAL improvements have been made by the Van Keuren Co., 12 Copeland Street, Watertown, Boston,



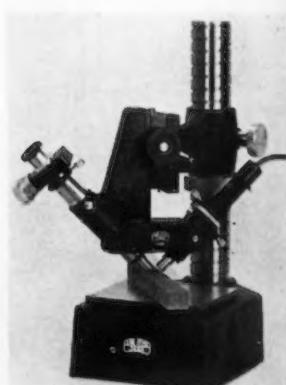
A NEW line of the Exact Weight Scale Co., Columbus, Ohio, is ratio counting scales. For counting an unknown quantity, the material is placed on the scale platform and a few pieces are placed in the ratio pan as directed on the counting bar. The pan is then moved along the beam until it balances, the reading then being made direct by the indicator above the pan. The scale may also be used for weighing out a predetermined quantity. The scale illustrated is a 300-lb. capacity bench model.

in its light wave equipment for checking combination gage blocks for flatness, parallelism and size, with the elimination of temperature variants. In comparing such blocks, they are wrung on a flat base and an optical flat placed over them. Interference bands show lack of parallelism or difference in size to millionths of an inch. The chief improvements have been in the light source, which is now a monochromatic light of practically one single wave length, and in the accuracy of the flats. The optical flat set consists of two 2-in. diameter by

CYLINDRICAL plug gages are now being supplied by the Grobet File Corp. of America, 3 Park Place, New York, in sizes from 0.010 to 0.084 in. in every 0.001 in. Other sizes and double end gages are available on special order. The plugs, made of high carbon tool steel, are ground and precision lapped to a guaranteed accuracy of ± 0.000025 in. They are held in a hollow hardened steel holder by a collet.

5/8 in. thick, single surface, semi-quartz master flats of 0.000002 in. accuracy and one 3-in. by 3/4-in. thick single surface master flat of 0.000001 in. accuracy. These flats are 100 per cent greater accuracy than previously guaranteed and the semi-quartz material has from 100 to 200 per cent greater wearing quality than the optical glass of former equipments. The flats are also much thicker.

The light emitted is so strongly monochromatic that the interference bands are clearly visible when the separation of surface is as much as 0.005 in. It is not necessary to exclude the air film by rubbing as in the past. Instead the air film is made use of in protecting the flats from actual contact and wear. The light tube is 10 1/2 in. overall length with chemically treated electrodes and has a 4-in. diameter coil. It is filled with a special gas that emits monochromatic light of 11.6 millionths inch per



IN the new Zeiss surface finish measuring microscope, an illuminating beam of light is passed through a narrow slit at 45 deg. to the machining marks on the surface being tested. This light produces a cross-section of the roughness of the surface which is observed through a microscope also at 45 deg. The section appears as a magnified luminous band and the depth of the machining marks may be measured by means of a micrometer ocular. Magnifications of 80, 145 and 240 times are provided. Finishes down to fine grinding may be measured and readings can be repeated within narrow limits. The instrument is sold through Carl Zeiss, Inc., Fifth Avenue, New York.



A LARGE amount of data essential to users of socket screws are found in this drafting room chart being distributed by Parker-Kalon Corp., 200 Varick Street, New York. Measuring 10½ in. in diameter, it gives the principal dimensions of hollow socket head cap screws, socket set screws and socket head stripper bolts corresponding to 17 nominal screw sizes. Coarse or fine threads per inch are also given for each size. Details of design, including tolerances, are given on the reverse side.

dark interference band. The tube is housed in an oak cabinet with the transformer equipment.

Tool Dressing Process

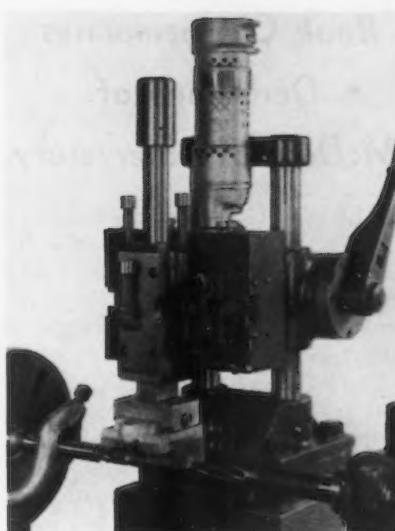
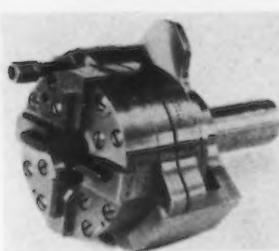
REATLY improved cutting life of edge tools is claimed by the Ultra Keen method now being used by the Cogsdill Twist Drill Co., Inc., 6511 Epworth Boulevard, Detroit. Using a combination of short motions of varying character, light abrasive pressure,

slow cutting speeds, hard abrasives and lubricant of proper viscosity, the amorphous surface left as a result of previous mechanical operations is removed, leaving what is said to be a truly crystalline structure at the cutting edge. Frictional heat resulting from speed and pressure in prior machining operations may attain a temperature high enough to anneal surfaces to a depth of 0.0005 to 0.003 in. This ductile surface, sometimes called grinding fuzz, wears quickly and is what is removed in the Ultra Keen process.

According to Cogsdill, tests made on the Abbott Profilometer show ir-

BELLO

NO. 1101 size, style DM die heads have been designed for use on No. 2 Brown & Sharpe automatics by the Eastern Machine Screw Corp., New Haven, Conn. Falling between the Nos. 101 and 102 sizes of H&G self-opening die heads, this new size is equipped with a front end trip for threading closer to shoulders, or it can be tripped by the customary pull-off. Capacity is up to 1 in. diameter.



COGSDILL'S Ultra Keen method of refining the cutting edges of such tools as reamers is an adaptation of the Super-finishing technique originally developed by the Chrysler Corp. The fine edge produced is said to contribute greatly to increased wear life or maintenance of original size.

regularities on the profile of an edge ground by conventional methods in the order of 60 micro-in., r.m.s. value. The irregularities of Ultra Keen edges are in the nature of 2.75 micro-in. Such finely finished edges are claimed to be much more wear resistant since failure of any tool is measured in the breakdown of the cutting edge, resulting in dimensional change, loading of material on the edge, galling and scoring of the work.

Magnesium Alloys Not Affected by Heating

IT is only rarely that difficulties are encountered in the heating of magnesium alloys, such as Magalloy. Short-time heating up to 300 and 400 deg. F., as, for instance, for two or three hours when baking enamel on castings, has no appreciable effect on the properties of cast magnesium alloys after they are brought back to room temperatures. The only exception to this is in the case of heat treatable casting alloys which have

been given only the solution treatment, according to Leslie Brown, of Magnesium Fabricators Division of Bohn Aluminum & Brass Corp.

Shrinkage of Magalloy castings is about the same as for aluminum alloys. Speaking of magnesium generally, about 70 per cent of the sand castings made are used in the airplane industry. The balance is for portable tools, assembly jigs and fixtures, foun-

dry flasks, match plates, patterns and core-boxes, reciprocating engine and machinery parts, circuit breaker parts, crankcases, transmission cases, searchlight bases and trunnion, street car motor housings and fittings, fans, moving parts and welding equipment, riveting equipment and hand tools. The uses of magnesium alloys are growing in the transportation field because of the tremendous elimination of useless dead weight.

Book Commemorates Dedication of McDonald Observatory

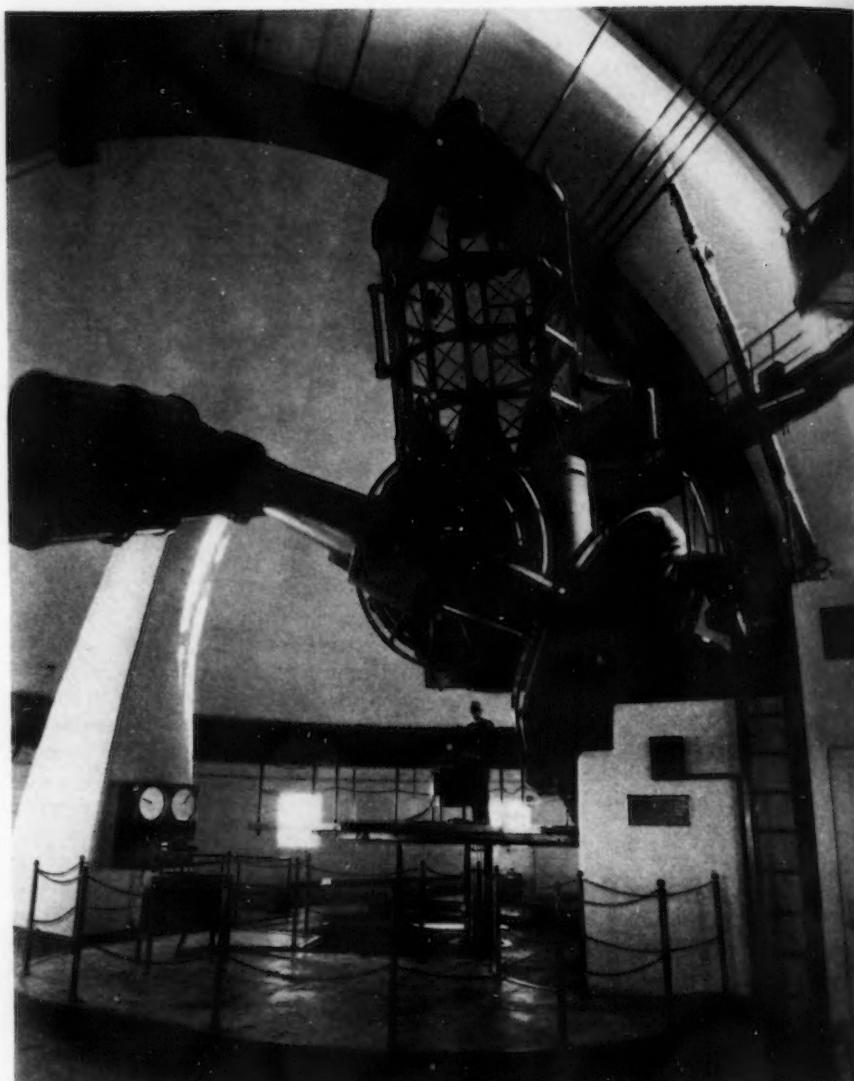
CLEVELAND—Warner & Swasey Co., Cleveland, has issued a 56-page illustrated book commemorating the dedication and formal opening of the McDonald Observatory of the University of Texas.

The foreword, written by C. J. Stilwell, president of Warner & Swasey, outlines the history of the observatory and tells how, following receipt of the contract for the observatory in 1933, the task presented many intricate problems, including the grinding of the 82-in. mirror.

Chapters are devoted to a discussion of astronomy, the telescope and the observatory, followed by a program of the dedication ceremony and the astronomical symposium May 5 to 8.

"To a man accustomed to speeding up factory production, the final stages of grinding the great mirror would have seemed a paradox indeed," writes Mr. Stilwell. "To avoid temperature changes which might cause distortion the mirror could not be polished more than 15 min. per day—and the polishing, done with rouge, was an operation so gentle, and the effect upon the surface so infinitesimal, that progress could not be measured by mechanical methods and had to be determined by optical devices."

The book is dedicated to the memory of the late Edward Parker Burrell, for many years director of engineering for the company.



McDONALD Observatory and its giant 82-in. reflecting telescope, the second largest in the world, were designed and built by the Warner & Swasey Co., Cleveland, for the University of Texas. Located high in the Davis mountains of western Texas and dedicated May 5, this observatory will be operated by the University of Texas and the University of Chicago.



THE big improvement in motor transport equipment of the U. S. Army is quite evident when the 1917 model Federal truck known as the "St. Bernard of the Army" during the World War is contrasted



with the streamlined Federal of 1939. The army has recently taken delivery of several of these new cab-over-engine Federal models. About 600 of the 2 1/2-ton Federals were used in France.



WILLIAM B. POLLOCK, II,
grandson of the founder
of the William B. Pollock Co.,
and president of the company
of that name.

AMERICA is a young country and hence longevity records of industrial and business concerns are more exceptional and more newsworthy than abroad. In England, for example, it is quite common for a concern to "stay in the family" for three or more generations, but not so in America. Here, not many concerns can boast of three quarters of a century under the same family management.

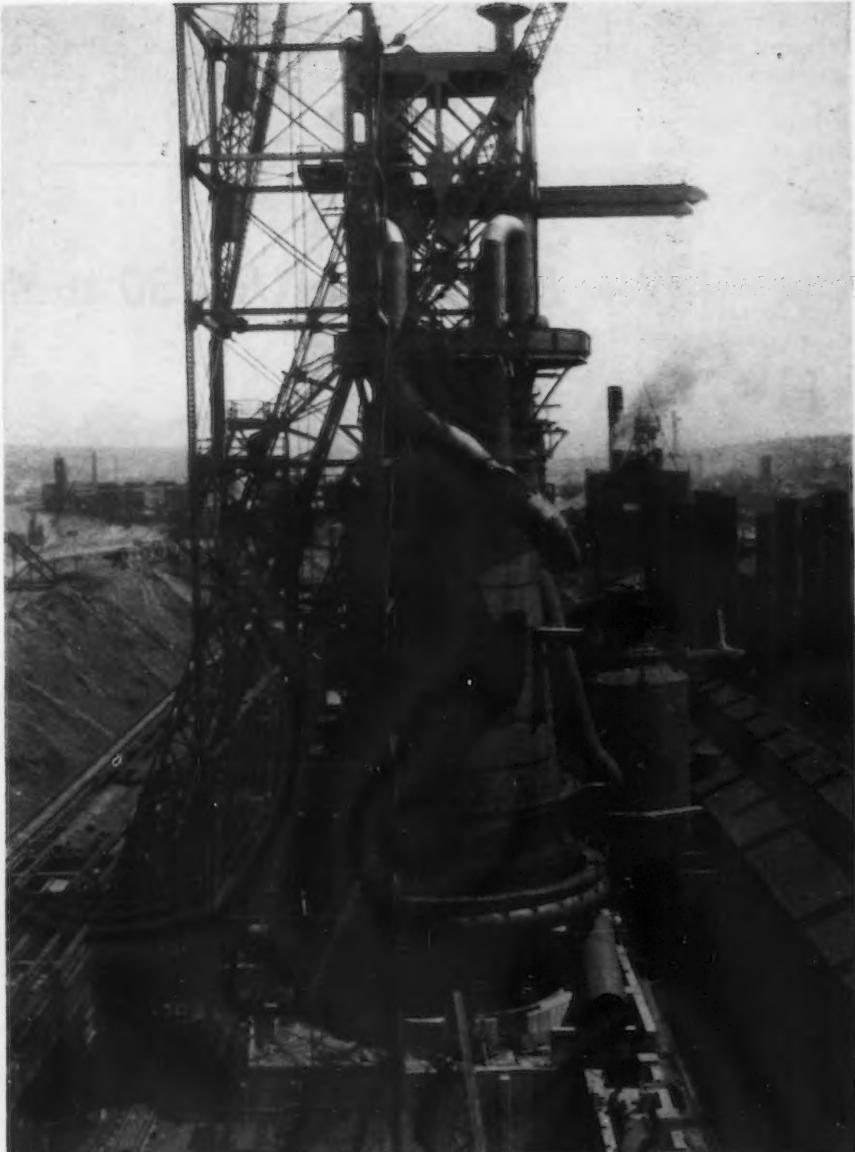
The William B. Pollock Co., Youngstown, is one of the exceptions. Last year it celebrated its 75th anniversary. We take pleasure in presenting the 1939 version of this industrial septuagenarian to our readers. And we wish Mr. William B. Pollock, II, and his fellow workers many happy returns of the day.

A BLAST furnace under re-
construction by the Pol-
lock Co. for a steel mill in the
Youngstown district.

SEVENTY-FIVE YEARS

IS A LONG,

LONG TIME



Some Observations on Iron Powder Metallurgy

(CONCLUDED FROM PAGE 41)

In Sweden the cost of the installation and equipment which is employed in the manufacture of sponge iron has long since been paid for by the tonnage which has been produced over a long period of time. High grade concentrates are available, the best of which can be diverted to the production of the powder product. Labor and power are both plentiful and moderate in cost. Experience in tonnage production and the technique of operation have been accumulated. Large scale facilities are available for immediate use. The product which is now being made is excellent and is being consistently improved to meet current specifications. It has been said it is responsible for the present expanded practical development of iron powder molding.

In view of these facts it would seem reasonable to assume that the production of domestic iron powder from local ores to compete directly on a price and quality basis with the Swedish product will not be the easy and extremely profitable venture which some of the current promotional literature would seem to indicate. Certainly the factors which have been mentioned should give pause for serious consideration to those who might be inclined to look at the potential market and discount the economics of the situation as it really is.

Those who have an opportunity to consider the details of the Swedish iron powder situation and to watch iron powder molding as it developed in this country, are inclined to discount statements that "advances in

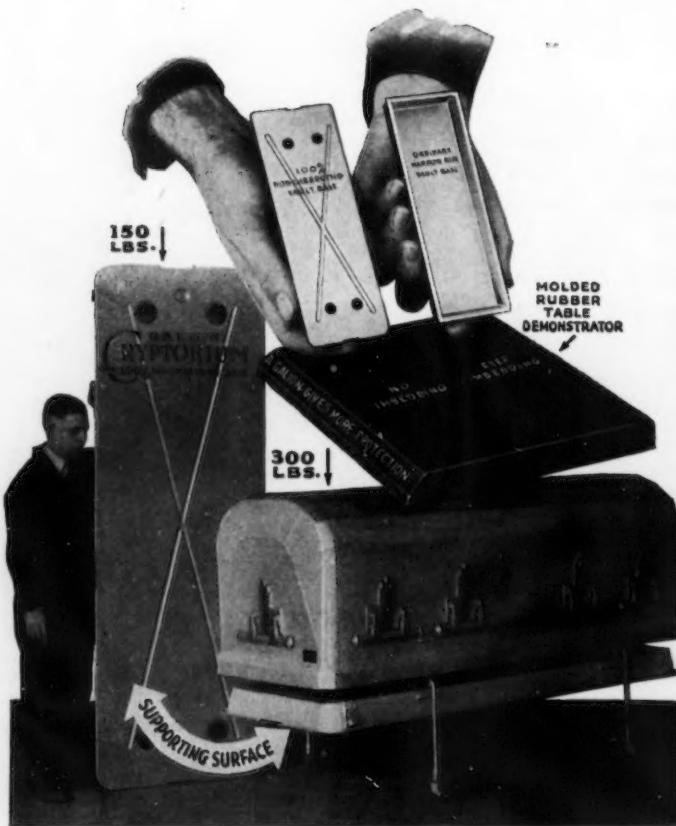
powder metallurgy (are) one phase of the potential market in which rapid strides presage early erection of domestic plants for economical production of iron" and "direct reduction of ores and scale at low temperatures (are) nearing long sought goal" which were the headings of a recent article on "Pure Iron Powder" in the April 10 issue of *Steel* by A. H. Allen. Certainly the important contribution which the Swedish powder product has made to the powder molding development in general merits better appreciation than the statement by Mr. Allen that "it appears that just now a number of important uses for powder iron are being proposed but with the supplies limited largely to Swedish source, progress is being stymied for economic reasons." After all we must, or should, be fair and give credit where credit is due. Certainly many of the iron powder parts which are now in quantity production in this country would never have been made if the price and quality of the Swedish powder had not been favorable for their economic production.

New Burial Vault Uses 30 to 40 lb. More Steel

HEREFORE the bases of "air-seal" steel burial vaults (under ground mausoleums) have been constructed more or less like inverted cake pans with the narrow edge resting on the ground and acting as the sole support for a heavy casket and the steel dome of the vault.

With all this weight (approximately 400 lb.) it was only natural that the narrow rim support would cut into the earth. However, the Galion Metallic Vault Co., of Galion, Ohio, now makes what it calls the "100 per cent non-imbedding" steel burial vault base. It is of box type construction with a heavy steel plate over the entire bottom, every inch of which contacts the earth and serves to support the casket and steel dome of the vault. This is illustrated at right.

Interesting to the steel industry is the fact that this type of vault base uses from 30 to 40 lb. more of sheet steel than the previous type. With hundreds of thousands of steel burial vaults manufactured, this important change in design will account for a sizable consumption of steel.



THIS WEEK ON THE ASSEMBLY LINE

By W. F. SHERMAN
Detroit Editor

... Auto production drops to the low point of year . . . Strike at Briggs likely to be prolonged for several weeks . . . Steel price cutting seen as damaging to automotive sales.

DETROIT—Continuation of the Briggs strike and its consequent tie-up of all Chrysler production and Lincoln-Zephyr output put a big dent in the auto industry's total number of assemblies last week and—together with holiday shutdowns—will further reduce production for the current week.

At the lowest level reached so far this year, assemblies in the past week totaled only 67,740 passenger cars and trucks in the United States and Canada, compared with 80,145 the previous week and 46,120 in the corresponding week of 1938, according to Ward's Automotive Reports. The major part of the decline occurred in Chrysler Corp. plants, most of which closed down Tuesday morning because of a shortage of parts made by Briggs. The Chrysler total volume last week was only 5640 units, against 17,900 the week before. General Motors Corp. held virtually steady, totaling 31,680 units against 31,792 the previous week.

Ford production, only slightly affected by Briggs' inability to deliver Lincoln-Zephyr bodies, was 20,350, a drop from 20,630. The individual output of the Big Three plants were unchanged at Ford (20,250) and Chevrolet (19,000) but at Plymouth it dropped from 8460 to 1555. Lincoln-Zephyr output dropped from 380 to 100.

Lower output for the current week will result from the closing on Tuesday for the holiday and also on Monday in most plants. Possibly some will be closed the remainder of the week, too. At least that was the major reason for the increased production at Ford and Chevrolet in the last two weeks, when each added one day to the work week.

Ford May Lead Production

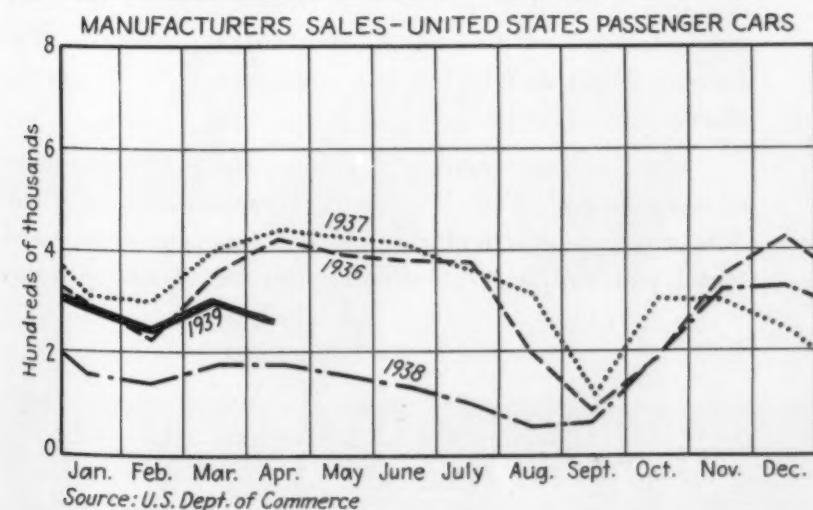
Regarding future schedules, Ford will probably produce about 3500 cars a day during June on a four-day work week, which will mean an output of

about 14,000 cars a week. In this, Ford promises to be the bellwether of the industry. A number of the others will be virtually closed within the next few weeks as was indicated, for instance, in word that Briggs, when the strike hit it more than a week ago, had nearly finished all of its stamping work for Chrysler for the year. Of course, the stampings are banked ahead of assemblies for about three weeks. This is rather definite indication that the Chrysler schedule, if unhampered by the strike, would have been concluded in June.

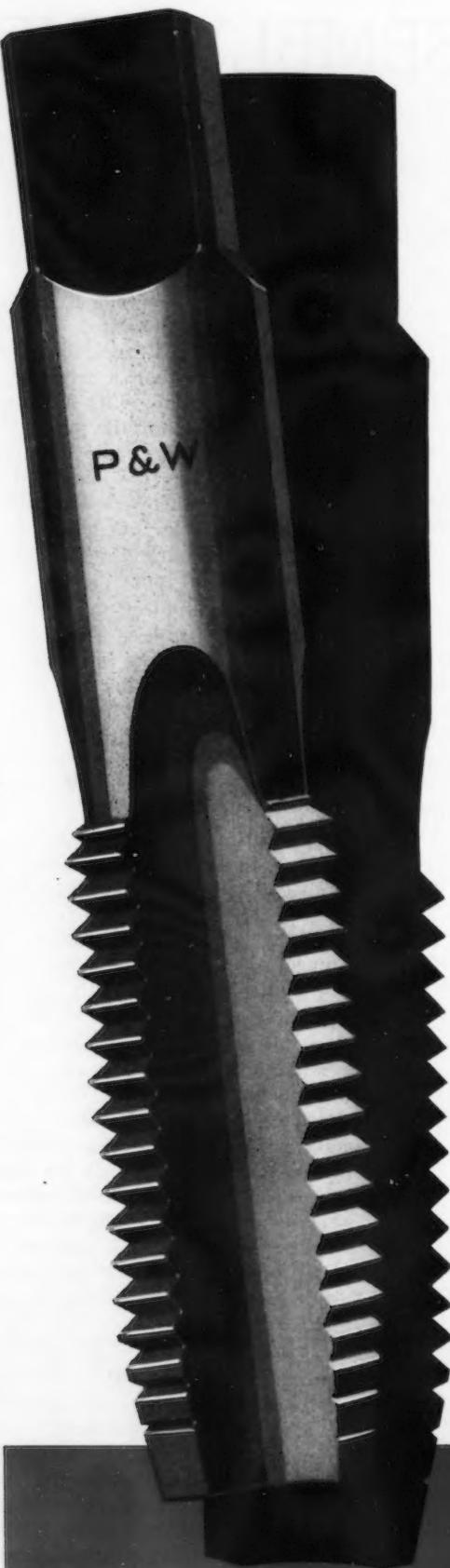
On the same subject (production schedules) there has been a change in Ford tractor plans. The initial lot of 50 (THE IRON AGE, May 11, 1939) will be given extensive tests before production is begun in earnest, so this will delay the beginning of the mass production schedule which earlier was revealed in this column.

Incidentally, suppliers know now that total authorized production of 1939 model Fords will be 635,000, more or less, with Zephyr totaling 21,000. The year will see 393,000 of the 85-hp. passenger cars built, compared with only 45,000 60-hp. cars. Automobile people generally will interpret this as quite a sharp answer to the advocates of low-powered cars. The ratio of buyers of 85-hp. cars to 60-hp. cars is 8.7 to 1. More than that, the figures show that 263,000 deluxe cars will go out onto the road compared with only 130,000 of the less expensive standard cars. The Mercury, the newcomer in the 1939 automotive field, is expected to score something like 62,000 units before the shades are drawn on its first year.

A sideline to the Ford business that is hardly ever recognized is the reconditioning of engines brought in from the field. Surprisingly, the Rouge plant completely rebuilds about 1000 engines a day, it is reported. In many industries such a volume would constitute a business by itself. In fact, despite Ford's natural advan-



PREPARED



for tap service

ON THE industrial front a wrong guess means lost time and money, and perhaps men's lives. But there is no need to guess. When it comes to tapping the threads that hold most mechanisms together we can give you exact knowledge.

Threads are so commonly used that often men forget their importance. Some threads need to fit loosely while others should be tight. It takes expert tapping knowledge to provide the right taps for the job so that the proper degree of accuracy will be maintained. The tap itself must stand up, and do its job economically. Only the tap that stays on the job pays dividends.

We can give you complete tap service. We carry hundreds of varieties of standard taps in stock—enough to meet most needs promptly. And we are able to design and make special taps to your specifications on short notice. No tapping problem is too small—or too large. We make all sizes and styles—from the smallest to the largest—and everything in between.

Pratt & Whitney taps are designed by expert engineers who know the right angles and rakes and clearances. Steel is selected that is particularly suited to the job, and laboratory analysis double-checks its correctness. Accurately controlled electric heat treating brings out every characteristic of toughness and cutting ability. The finished Pratt & Whitney tap is as perfect as human endeavor can make it.

Send us your tapping problems, and get the opinions of our experts. Try the taps they recommend—Pratt & Whitney taps particularly selected for your work—and watch your tapping costs drop as your troubles smooth out.

PRATT &

and mobilized to all industry



WHITNEY DIVISION NILES-BEMENT-POND CO.
HARTFORD, CONNECTICUT

tages in handling such quantities of work, there are several competitors in the field, including one of the nationwide mail order houses, which are reconditioning and selling Ford engines. Ford practice is to replace all worn parts with factory "firsts" and subject the engine to all of the standards and tests set up for the new motors.

Briggs Strike May Be Prolonged

The strike at Briggs (THE IRON AGE, May 25, page 85) appears, from this vantage point, likely to run a long and bitter course. A fight between Homer Martin's independent UAW and the UAW-CIO which initiated the strike, seems to be in prospect. This would mean a long-drawn-out labor struggle, with Briggs playing the part of a silent onlooker through the major part of the battle. And with Briggs' 1939 production schedule nearly complete, it would not be surprising if the company did just sit with closed gates while Martin and the CIO traded thrusts.

During the past week developments occurred in the strike which are of general knowledge and widely publicized. They include the fact James F. Dewey, federal conciliator, was told

Wednesday by W. P. Brown, president of the company, that as the company's position was "well-known to all concerned" he (Brown) felt that "the controversy had perhaps passed beyond the point of mediation." Later in the day an appointment for an initial conference with the conciliator was carried out, and on Thursday a joint conference lasting an hour and a half was arranged. This session was adjourned until Monday of this week and the conciliator left town to attend the funeral of a brother in Philadelphia.

At this stage negotiations between the striking CIO group and Briggs were interrupted by what may prove to be an historic bit of interference by Homer Martin. He arranged a conference with Briggs officials and is seeking a contract from the company for his independent UAW.

Even Dewey, the conciliator, disavowed any connection with this session, while R. J. Thomas, president of the UAW-CIO, issued an ultimatum:

"We will permit Briggs and Martin to negotiate by themselves and see whether an agreement with a paper union can open the plants."

It is easy to see where the bi-union argument will lead. Before the week was out a Martin car with a loud-speaker was chased through the city streets by a CIO motorized squad because the Martin car attempted to advertise a union meeting to Briggs pickets.

The strike and the inter-union battle have all the earmarks of being a life and death matter and may last several weeks more. Besides, there is a possibility that the outcome may permanently affect the auto industry's open shop status.

For the CIO faction, which has the larger membership, it is an opportunity to try for the "union shop" clause in its contract, and that would be a big step toward building up a bank account through revivified dues collections. Also, it is the opportunity for Emil Mazey Briggs UAW president, former welder, and alleged Communist leader, and R. J. Thomas to win their spurs in the organization.

Homer Martin has a lot to gain, even through mere interference, it seems. Since his break with the CIO he has had nothing newsworthy to tell his followers except on occasion when the organization was forced to delay meeting its payroll. This is the first time Martin has had a chance to drive a wedge any place.

Briggs apparently decided before the strike broke that it would prefer to sacrifice the remaining weeks of 1939 production rather than grant the CIO virtually a closed shop agreement. Immediately after the strike was called, on Monday and Tuesday, Briggs suspended all operations and even pulled the fires under boilers. The company is an important supplier to Ford and Chrysler. One complication is seen in the fact that Ford has frequently stepped in before and instructed suppliers to end their strike and keep up deliveries of parts needed in production. However, in the past year Briggs has been shipping Ford only the bodies for Mercury and Lincoln-Zephyr cars.

It is the shrewd guess of union leaders who know the situation closely that even if there is a compromise agreement within the next few weeks, the auto unions will make the closed shop, or union shop, the next big issue because treasures have been imperiled by poor dues collections for considerably more than a year.

Steel Price Cutting May Hurt Automobile Sales

Wherever the drastic steel price cuts may have originated, and whether they were urged by automotive steel

THE BULL OF THE WOODS

BY J. R. WILLIAMS



buyers or not, expert opinion holds that not only the steel companies will suffer. It is generally admitted in Detroit that the long-run effects will be demonstrated clearly in a reduction of the size of the automobile market. Even steel buyers themselves have admitted that the recent savings on steel are not enough to warrant the sacrifice of many potential sales.

Such sacrifice of sales is likely. The case of one man on a steel sales force is typical—based on a great deal of recent contact with “rank-and-file” opinion. “The average young steel salesman,” he said, “probably gets \$180 a month. A more experienced man, with dependents, probably gets \$250 a month out of this business. And the junior executive is usually in about the \$300 bracket.

“Because steel companies are in the red, and are being forced to take this low-priced tonnage again, all of these white collar workers are losing a day a week—and 10 to 15 per cent of their salaries. That’s just about equal to the monthly payment on a new car!”

He cited his own case. He was making monthly payments of \$20 to \$30 on a car, and would have had it paid for in early spring. When he finished paying for it he was going to keep saving the same amount every month for about six months so he would have the cash to turn over with his old car on a new model this fall.

“Now I am on the short week and losing just about as much pay as I had intended to spend on a car. I’m not going to buy the new car.”

Even assuming that a substantial part of the steel savings can be passed along to the automobile purchaser (and last week it was pointed out that the savings really won’t be so great because automobile companies have enjoyed substantial cuts for a number of years) the auto industry is likely to find that the effects on steel payrolls will be detrimental to automobile sales.

Last week another side of the story was told by a purchasing agent who admitted that the company which got a lot of his firm’s tonnage for next year had lost his good will. His objection was a human one. He didn’t like to see steel company executives come into the office over his head, give prices to the managing officials of his company, who in turn ordered the PA to “place the tonnage there.”

Pidgeon-Thomas Iron Co., Memphis, Tenn., was recently appointed distributors for the entire line of Page coated welding electrodes and Page gas welding wires manufactured by Page Steel and Wire Division of American Chain & Cable Co., Inc., Monessen, Pa.



DIES are one of the most important factors in the cost of sheet metal parts. When properly engineered, they minimize the number of press operations, required blank size, and the amount of final metal finishing needed. Good die design, plus a wise selection of die steel, reduces marking, pickup and galling—all of which increase the amount of finishing required. • The steel panels shown above were produced from Cimatool dies, and as none of these photographs have been retouched, all areas that required final metal finishing show up very plainly. A glance indicates how little of this was found necessary. • Cimatool die designers have a very broad experience in dies for many types of products—large dies as well as small ones. And the Cimatool die department is fully equipped for dies of any type. This equipment includes large crank and toggle presses (796½) for try-out work. When delivered, Cimatool dies are complete in every respect—ready to be put to work. • Call in Cimatool engineers on your next tool and die job.



THE CIMATOOL COMPANY
Dayton, Ohio, U.S.A.

THIS WEEK IN WASHINGTON

*... Hints that Roosevelt seeks third term frightens business
... Senate rail bill exempts lakes ore and coal carriers . . .
LaFollette sees welcome for his espionage bill . . . Larger
stocks of war materials are approved.*

• • •

By L. W. MOFFETT

Washington Editor, *The Iron Age*

• • •

WASHINGTON—Whether true or false that the President launched his third term candidacy in his address before the American Retail Federation here last week, many business men are jittery lest that is just what it was. Aware of the tremendous political power of the billions he has had and still has at his disposal, they fear greatly that the President might, much to his personal pleasure, break another of many precedents and triple to the White House. What appears to be political logic indicates that Mr. Roosevelt, should he run again, cannot repeat. For one thing he is probably more cordially disliked in the Democratic party than even in the Republican party and if he attempted to perpetuate himself as President, there is a widespread belief that it would cause a split in the former which would make defeat certain. Nevertheless, the thought of Mr. Roosevelt or one ready to continue New Deal policies after 1940 is frightening to large segments of business. In this group are many small manufacturers, who are particularly hostile to the Administration, feeling that its policies are even more injurious to them than to so-called big business. At the same time relatively there are probably more administration supporters in distributing trades in small business than there are in other sections of business.

Bait for Retailers

That the Administration is aware of this situation was made clear in the President's appeal to retailers. In announcing no retreat of New Deal policies and clearly implying plans for an-

other Government spending spree, the President boldly held out the alluring bait that more than 50c. of every dollar spent by the Government went over the counters of the retailers. Yet, judging by the lack of applause, this statement failed to get the response which was hoped for, despite the advance staging of the meeting. It was evident from the general reaction to the speech that there was, symbolically, a large element among the retailers which does not support the New Deal by any means. Some of the retailers' addresses offered conclusive evidence of this fact. Also off the record many of them indicated as much concern as more outright opposing business groups over the possibility of Mr. Roosevelt running for a third term. To them the reference to retailer's share of the Government dollar made no appeal. Indeed it occasioned considerable resentment. They were sour too on the proposal to continue deficit spending. Opposition to repeal of the undistributed profits tax, unless the \$20,000,000 annual revenue which the President said it yields could be made up in some other form of taxation, was as much off-key to them as to big business. They did not agree with the President that the tax controversy is a case of "making a mountain out of a molehill." They indicated awareness that whatever comes to them from Government spending they will have to pay for through much of their own goods through taxation.

Split Strategy Fails

If the President's acceptance of the invitation to address the retailers, following on the heels of his refusal to

address the Chamber of Commerce, was intended to develop a split between little business and big business, it was a flop. At the outset, if there was such a strategy attempted, it was based on a misconception because a large majority of the chamber membership is made up of small business men.

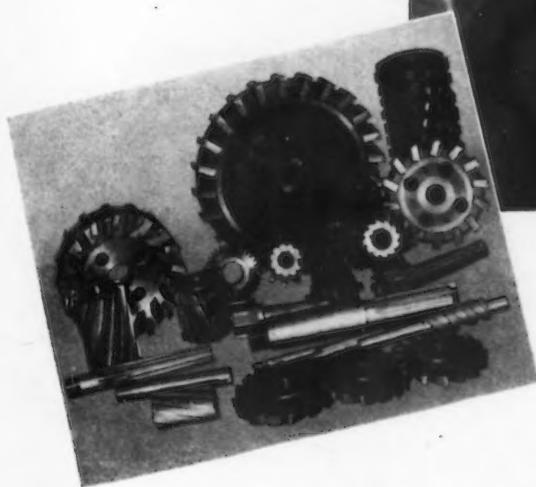
The President made a typical speech. He engaged freely in rhetorical phrases, mimicry, caustic criticism of opponents and warm endorsement of his own policies, couched in what many think were terms of sophistry. The impression was given that he realized he was on the defensive and that to protect himself it was necessary to be especially aggressive.

As an intended amusing feature of his speech, the President set up and knocked down the usual straw dummy, stuffed as a business man, who is invariably represented as pounding the Presidential desk and yelling for a healthy cut in Government costs. As usual also, this mysterious visitor is so dumb and supine that he can't say and stick to it that the Administration should knock down large slices of the Federal bureaucracy when he is asked "Just where would you cut expenditures?" His utter ignorance of the budget and lack of knowledge of other problems which apparently only the President can possibly understand are exploited as the final knockout blow is given. There is only one thing this benighted business man of concealed identity can do. He does it. He concedes Government expenditures can not be cut. Whereupon, in sackcloth and ashes, he departs from the White House, humbly and acutely aware of what happens when a pigmy mind attempts to parry wits with a masterful intellect.

Who Is This Man?

The case for deficit spending is made, and the unbalanced budget can swing safely forevermore out of its orbit to the benefit of business and the country as a whole. It should be added that, while this still unidentified individual who, despite rebuffs, insists on haunting the sacred precincts of the White House, was given no family name, he was given a name of contumely. He was figuratively held up, spotlighted and termed "a wild-eyed

FOR ANY SHOP WHERE CUTTERS ARE USED



ANY shop foreman who has milling machines under his supervision knows the importance of correctly sharpened cutters . . . and having them when they're needed. It's easier to get the most out of your milling machines when these factors are fulfilled, and it's easier to maintain high cutter efficiency with CINCINNATI No. 2 Cutter Grinders.

With this machine, you may sharpen all types of milling machine cutters, reamers, hobs, taps, etc. The small illustration shows various types of cutters, all of which were sharpened on a CINCINNATI. Catalog M-777, listing the features of these machines, is yours for the asking.



A SYMBOL OF A DEFINITE STANDARD
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You will be pleased with the genuine cooperation and the real assistance your inquiry will bring.

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radical," who is "gambling on a hunch." As for the President he called himself a "conservative." Some thought that the President's own identification was well taken for the occasion. It was the view that he is too conservative to boldly face the inevitable problem of sharply cutting Government costs.

Instead he made it dishearteningly clear that he is relying on increased tax revenue from a greater national income—\$80,000,000,000 is fixed as the ideal goal—to overcome deficits. To the growing numbers who are convinced that there will never be recovery under Mr. Roosevelt's administration, there was shaking of heads at prophecies of an upsurge of business while he is in office that would boost the national income to such a hoped-for figure.

Bull's Eye for WPA

Considering the group that the President was addressing it is not surprising that he made the realistic appeal concerning the large portion of the government's (borrowed) dollar that goes over the counter of the retailer. By the same token he scoffed at those who "say that we should glue all of our attention on the heavy industries and should do everything to get these industries to work and to get investors to put up the money to build new buildings and new machines without regard to the average consumer's need or his ability to use these buildings or machines."

This was a bull's eye for WPA. It was a smash at Hustling Harold Ickes' PWA and other administration sources which at the very moment of the address were trying to trump up Government schemes—more spending of course—in another futile effort to prime the pump. Nevertheless, there is reported to be strong chances for another appropriation of \$500,000,000 for PWA.

The speech was widely designated as a political effort only. It was discouraging to business. It was not unexpected because the day long has passed when an attempt is made to predict what the unpredictable administration will do or say.

Truck Schedule Suspended

WASHINGTON—The Interstate Commerce Commission has suspended from May 24 to Aug. 22 a schedule proposing motor truck rates per 100 lb., minimum 18,000 lb., of 46c. from Pittsburgh and 47c. from Chicago to Fostoria, Ohio, on brass, bronze or copper strips or sheets.

Industry Will Like His Bill, La Follette Says

WASHINGTON—Senator Robert M. La Follette, who for more than two years as chairman of the Senate Civil Liberties Committee investigated alleged cases of industrial espionage and violations of civil liberties by employers, last week launched public hearings on his bill to prohibit some of the practices uncovered by his committee.

Reviewing most of the reports issued by the committee as a result of the inquiry, the Senator told the subcommittee of which he is chairman that the bill does not set up a new Federal administrative agency, does not interfere with the right of employers to protect company property and will ultimately be welcomed "even by those connected with companies which now cling to these oppressive practices."

Practices prohibited by the measure include use of labor spies and labor espionage; use of strikebreakers and strikebreaking agencies; use of privately paid armed guards off the employers premises; and the possession and use of industrial munitions such as tear gas and sub-machine guns.

Maritime Commission Shipbuilding Program Lags

WASHINGTON—A checkup on the Maritime Commission's shipbuilding program disclosed this week that the agency will have to speed up its construction activities considerably in the next six months if it expects to reach by the end of 1939 its announced goal of ordering 50 ships a year.

So far this year only 16 ships, comprising six C-3 cargo vessels and ten C-3 combination passenger-cargo ships, have been ordered. Last year at this time 21 ships had been contracted for. Since there are no bids outstanding and since there is an average time lag of some 50 days between the time bids are invited and when they are received, the commission will be 13 ships behind its 1938 schedule by the end of July. Contracts for 47 ships were awarded in 1938, or three less than the 50-ships-a-year-goal.

The most recent contracts were awarded on March 15 when four C-3 combination diesel ships and four C-3 cargo turbine vessels were ordered. This brought to 66 the total number of ships under construction under the commission's shipbuilding program.

Government Steel Contracts \$545,401

WASHINGTON — Government contracts for iron and steel products, as reported for the week ended May 20 by the Labor Department's Public Contracts Division, totaled \$545,401. For the same period contracts amounting to \$99,232 for non-ferrous metals and alloys and \$287,115 for machinery were reported. Details follow:

Iron and Steel Products

Struthers	Wells - Titusville Corp.	
	Titusville, shafts, propeller	\$27,932.00
Baldwin	Southwark Corp., Eddy-	
stone, Pa., castings		38,850.00
Western Pipe & Steel Co. of Cali-		
fornia, San Francisco, pipe		11,919.56
Consolidated Supply Co., Portland,		
Ore., steel pipe		11,807.60
Noland Co., Inc., Washington, D.		
C., pipe, iron		12,820.36
Southwest Welding & Mfg. Co.		
Alhambra, Cal., land pipe		73,024.00
Bethlehem Steel Co., San Francisco		
and Seattle, reinforcing steel		114,091.00
Bethlehem Steel Co., San Francisco		
and Seattle, deformed bars		13,048.24
Republic Steel Corp., Cleveland,		
copper steel plates		27,291.63
Carnegie-Illinois Steel Corp., Pitts-		
burgh, steel, bar and strip		10,660.00
Columbia Steel Co., San Francisco		
and South Chicago, steel bearing		43,725.00
piles		
Bethlehem Steel Co., Los Angeles		
and Lackawanna, N. Y., steel		
sheet piling		19,270.33
American Bridge Co., Denver and		
Gary, Ind., gate frames		124,078.00
Joseph Lehman Co., Inc., Brook-		
lyn, N. Y., roof jacks		16,883.59

Non-Ferrous Metals and Alloys

Scovill Mfg. Co., Waterbury, Conn.	
tubes, brass	\$30,824.80
Nickel	50,750.00
American Hollow Boring Co., Erie,	
Pa., recoil cylinders	17,657.52

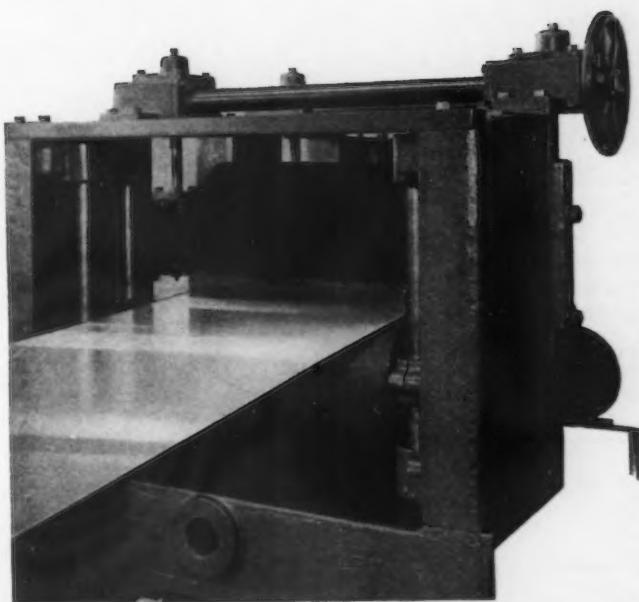
Machinery

Continental Motors Corp., Detroit,	
parts for engines	\$15,395.27
Swind Machinery Co., Philadelphia,	
machines, boring, drilling, milling	20,997.00
Swind Machinery Co., Philadelphia,	
machines, boring, drilling, milling	31,270.00
Marshall & Huschart Machinery	
Co., Chicago, gear hobbing mch.	10,504.00
The American Tool Works Co.,	
Cincinnati, lathe, engine	50,775.00
The R. K. Le-Blond Mch. Tool Co.,	
Cincinnati, lathes	34,448.00
Tidewater Supply Co., Inc., Norfolk,	
Va., machines, boring, milling,	31,631.00
drilling	
Northern Pump Co., Minneapolis,	
Minn., pumps	11,990.00
Barber-Greene Co., Aurora, Ill.,	
paver	10,299.95
Western Tractor & Equip. Co.,	
Seattle, Wash., land clearing	11,755.00
tractor, dozer	
Silent Hoist Winch & Crane Co.,	
Brooklyn, N. Y., winches	25,460.00
M. L. Bayard & Co., Inc., Phila-	
delphia, elevators, freight	32,590.00

New Machinery Wear Measure Announced

WASHINGTON—The National Bureau of Standards reports it has developed a new method for measuring the amount of wear which takes place on the bearing surfaces of machinery, the Department of Commerce has announced. This method consists of making minute indentations in the surface of the bearing by means

STEP UP PRODUCTION
CUT FINISHING COSTS



MANUFACTURERS of light gauge metal save two ways when they install Pittsburgh Plate Glass Company's Spiral Wound Brushes on their production lines. Such an installation never fails to increase output and to bring a substantial reduction in finishing expense.

Investigate! Spiral Wound Brushes are available in nickel silver wire, horsehair and tampico. And all are refillable.

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BRUSH DIVISION • BALTIMORE, MD.

of a specially shaped diamond point and measuring the dimension of the indentations both before and after the bearing has been subjected to use.

The dimensions of the indentation of the bearing surfaces change in accordance with the amount of material which is worn off the bearing by use. It was pointed out that by measuring the changes in the dimensions of the indentation it is possible to quickly and accurately determine the extent of wear that has taken place on the bearing surface.

Larger Stocks of War Materials Approved

WASHINGTON—House and Senate conferees on the bill authorizing the purchase, transportation, rotation and storage of strategic and critical materials for wartime requirements last week turned down the White House request to limit expenditures to \$40,000,000 over a four-year period and adopted instead the House proposal to spend \$100,000,000 over the same period.

The conferees also approved these

provisions of the bill which has passed both Houses of Congress:

1. Purchases are to be made under the Buy American Act and a reasonable time, not exceeding one year, is allowed for delivery by domestic sources.

2. Purchases are to be made when the domestic production or supply is deemed insufficient to meet industrial, military and naval needs.

3. The Secretary of the Interior will act jointly with the Secretaries of War and Navy in determining qualities and quantities to be purchased and which materials are strategic and critical.

4. The Secretary of the Treasury will report annually on expenditures and methods used for rotation of materials to prevent deterioration.

5. Materials are to be used only in time of war or when a national emergency exists. The Senate proposal which would have permitted the President to sell stocks when too large was dropped.

After voting for \$100,000,000 of ex-

penditures called for in the House draft, the conferees turned down the House-approved provisions providing for purchase of commodities from World War debtor nations and applying the credits toward paying off the principal.

March Tin Production Lowest in Five Years

WORLD tin production in March declined to 7500 tons, the lowest monthly figure in five years, according to the International Tin Research and Development Council. Output in the March quarter was 33,400 tons, down 23 per cent from the comparable period of 1938. Consumption in the first quarter was 35,700 tons, a drop of 13 per cent from the first quarter of 1938. With the exception of the United Kingdom, which used 800 tons more in the first quarter of this year than in the corresponding period of the past year, consumption of tin in all the major consuming countries continues to move downward. In the United States first quarter consumption was 13,500 tons, off 7 per cent from the similar quarter of 1938.

World tin plate output in the first quarter was 950,000 tons against 766,000 tons in the comparable period of 1938.

Ordnance Division Awards Machinery

WASHINGTON—The War Department's Ordnance Division last week announced awards under the special machinery program totaling \$308,263 to the following:

H. R. Krueger & Co., Detroit, \$9,465 for broaching machine; Fitchburg (Mass.) Grinding Machine Corp., cylinder and cone grinder, \$4,125; Hanson Whitney Machine Co., Hartford, Conn., universal thread milling machine, \$5,665; Ferracute Machine Co., Bridgeton, N. J., hot trimming presses, \$5,160; Cincinnati Milling Machines & Cincinnati Grinders, Inc., Cincinnati, automatic milling machines, \$27,594; George T. Schmidt, Inc., Chicago, hydraulic marking machine and fixtures, \$1,803; Hardinge Brothers, Inc., Elmira, N. Y., precision bench milling machine, \$1,542.50.

At the same time the Air Corps announced that the United Aircraft Corp., Pratt & Whitney Aircraft Division, East Hartford, had been awarded a \$303,436 contract for spare engine parts.

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Quality Springs
ALL SHAPES • ALL SIZES • ALL MATERIALS



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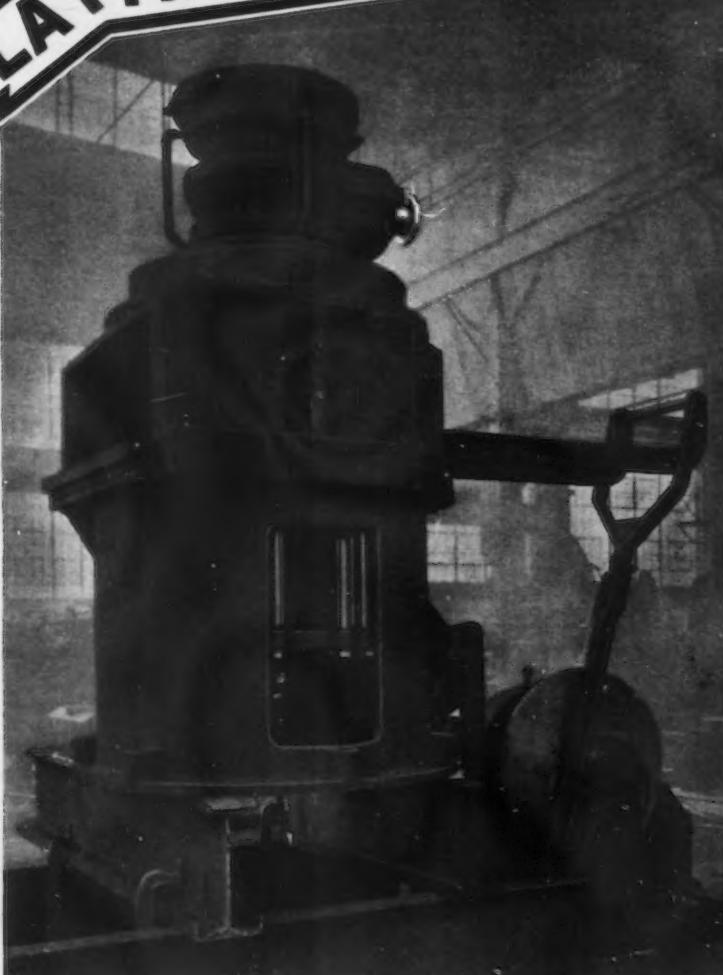


Are your laying reels a "clearing house" or a "bottle neck?" Can they take No. 5 rod at maximum delivery speeds of present day rod mills or do they slow down other operations?

Morgan Laying Reels help to maintain high speed and high quality in the modern rolling mill. Morgan engineers, with their wide experience in solving coiling and other rolling mill problems, will gladly help you remove the lags and combine better production with good profits.

**MORGAN CONSTRUCTION COMPANY
WORCESTER, MASSACHUSETTS, U. S. A.**

R-57



LET  **REMOVE THE LAGS**

PERSONALS . . .

FOREST J. SMITH has been appointed superintendent of industrial relations at Gary works of Carnegie-Illinois Steel Corp. He was assistant superintendent and succeeds WALTER S. MACNABB, who has been named the new assistant division superintendent for the open hearths and central mills of Gary works. WALTER BENNETT, who was assistant to the division superintendent in charge of personnel matters of the open hearths and central mills, has been promoted to Mr. Smith's former post as assistant super-

intendent of industrial relations. Mr. Bennett will be succeeded by J. S. McMAHON, who has been stripper and mold yard foreman in the No. 3 open hearth shops.

T. J. GRIFFIN, formerly superintendent of the central mills at Gary works, has been appointed assistant to the division superintendent of the open hearths and central mills. T. H. SANDERSON, heretofore contact representative of the metallurgical division in the Chicago office of Carnegie-Illinois, has been appointed assistant to the superintendent of the Gary rail mill. STANLEY J. BROWN, formerly an inspection foreman, has been made general foreman of the finishing and shipping department of the rail mill. The former assistant chief inspector at Gary works, EDGAR N. YOST, has been promoted to the post of chief inspector.



W. ROBERT TIMKEN has been appointed assistant to the president of the Timken Roller Bearing Co., Canton, Ohio. He has been identified with the company since his graduation from Harvard University in 1933, serving in various capacities.



K. A. ZOLLNER has been made assistant sales manager of the hardware products division of the Wickwire Spencer Steel Co., New York, and of its subsidiary the American Wire Fabrics Corp. He has been associated with the advertising department of the two companies for the past 12 years and will continue to direct the advertising and promotional activities.



LEONARD E. NICHOLS, formerly chief welding engineer of the National Electric Welding Machines Co., Bay City, Mich., has been made technical adviser and sales engineer for the Detroit district sales division, with offices in the General Motors Building, Detroit.



EDWIN J. SCHWANHAUSSER, who has been works manager of the Buffalo works of the Worthington Pump & Machinery Corp., Harrison, N. J., has been elected a vice-president. He has been identified with the company since his graduation from Stevens Institute of Technology in 1915.



FRED G. GURLEY, since May, 1936, assistant vice-president of the Burling-

Greater Tonnage
Per Edge of Blade

A

AMERICAN
SHEAR KNIFE CO.
HOMESTEAD - PENNSYLVANIA



F. J. SMITH



WALTER BENNETT

ton Railroad, has been elected a vice-president of the Santa Fe Railroad, where he will be general executive assistant to the new president, E. J. ENGEL. Mr. Gurley began his railroad career as a Burlington railway clerk in the superintendent's office at Sheridan, Wyo., in 1906. He went to Chicago in 1932 as assistant to the operating vice-president of the Burlington and later was assistant to the executive vice-president.

♦ ♦ ♦

VINCENT H. GODFREY has joined the general sales staff of the Page Steel & Wire Division of the American Chain & Cable Co., Monessen, Pa. Mr. Godfrey, who was graduated from the



W. S. MacNABB



E. N. YOST

THINK FIRST—

THEN ACT

•PRECISION
LANDIS
GRINDERS

GRINDING equipment is requested by the manufacturing division. Then what happens? Executives study the needs and investigate what available equipment can do to meet these needs. Too often however, because of today's uncertainties, nothing more is done than ♦ ♦ ♦ thinking.

Thereby profits are lost, while the wide awake competitor who does act gains ground rapidly. We should like to cite an electric razor manufacturer who thought first but after reaching conclusions acted and acted quickly. In less than one week after the original inquiry, he was convinced that a Landis 6" x 18" Type C Plain Hydraulic Grinder would answer his severe requirements. He purchased without delay. Today, he continues to successfully meet competition.

Thinking is necessary and commendable. So is action—just the same when grinding equipment purchase is being considered as in practically all other of life's activities.

No. 298

LANDIS TOOL COMPANY, WAYNESBORO, PA.

United States Naval Academy in 1915 and was formerly a Lieutenant Commander of the United States Navy, will specialize in the sale of welding electrodes and gas welding wires.

* * *

FRANK ELWELL, works engineer of the Buick division of General Motors Corp., has been named president of the Flint Industrial Executives club for next year. Other officers are L. W. JOHNSON, Chevrolet parts and service manager, vice-president; ALBERT J.

PROCTOR, AC Spark Plug Co.'s plant superintendent, treasurer, and HERBERT MOHAN, Fisher Body superintendent, secretary.

The club has a membership of more than 1600 factory foremen, superintendents and other executives embracing all manufacturing organizations in the city. It boasts an average of more than 1200 attendance at its monthly meetings throughout the year and is considered one of the most active organizations of its kind.

PRODUCTS
Steel Castings
Forgings
Rolled Wheels
Heavy Springs
Rolled Rings
Gear Blanks

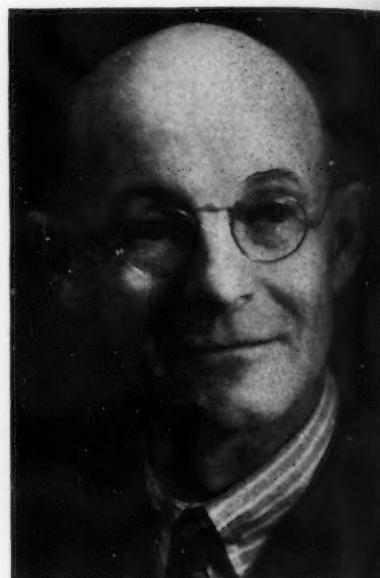
GREATER MILEAGE CRANE WHEELS

The principal advantages of Standard rolled steel crane wheels are greater strength and toughness and better adhesion to the rail with a minimum of wear on the wheel and rail.

The open hearth steel used in these wheels is produced in our own furnaces subject to close metallurgical control.

STANDARD STEEL WORKS CO.
Subsidiary of The Baldwin Locomotive Works
PHILADELPHIA, PA.
WORKS: BURNHAM, PA.

STANDARD



FRANK ELWELL

F. E. VIGOR, manager of the Ashland, Ky., division of American Rolling Mill Co., has been appointed general transportation manager; R. R. SMITH, general superintendent of the Ashland division, will succeed him as manager; and R. G. ADAIR, assistant director of personal and public relations, has been appointed assistant manager of Armc operations in Ashland.

F. E. Vigor, in addition to becoming general transportation manager will be associated in the management of the company's extensive coal and ore properties and river transportation. He has been a member of the



F. E. VIGOR



R. R. SMITH

Armco organization since June, 1910, when he was employed as chief clerk in the traffic department. Later he became assistant traffic manager. In 1928 he was transferred to Ashland as assistant manager and was appointed manager at Ashland in 1929. He will be located in the company's general offices in Middletown.

R. R. Smith, who succeeds Mr. Vigor as the Armco manager at Ashland, has been general superintendent there since 1930. He joined the company's organization in 1912 as a foreman in the sheet mills, later becoming sheet mill superintendent.



R. G. ADAIR

In 1922, the company transferred him to Ashland where the world's first continuous sheet rolling mill was being constructed. When completed he was made responsible for producing the first sheets made by the continuous method. In 1925 he became assistant general superintendent of the Ashland plant.

R. G. Adair, new assistant manager at Ashland, has held several important positions in Armco's personal and pub-

lic relations activities. Joining the Armco organization as a laborer in 1917, he became a foreman, safety engineer, and, in 1930, assistant to the manager of the Armco plant in Butler, Pa. He was appointed assistant director of personal and public relations in 1937.

K. C. McCUTCHEON has been made general superintendent of the Ashland plant; W. FRED SONGER, assistant to

(CONTINUED ON PAGE 91)



YES, SIR- it's an ACCURATE *Spring*

HERE is a flat wire spring that will have the mighty important job of keeping an automobile door closed. Slam! — Bang! —

open and shut — thousands and thousands of times. Tough job? — sure but it's an Accurate Spring — built to take it!

You can almost tell that it is Accurate-made by simply looking at those perfect coils. But the most important features of an Accurate Spring you can't see! We mean — the research — the design and engineering — the precision manufacture — all the things that build the quality of Accurate Springs. Always insist upon those advantages. Send us your blue prints or ask to see an Accurate engineer.

COMPRESSION SPRINGS
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EXTENSION SPRINGS
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TORSION SPRINGS
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FLAT SPRINGS
•
WIRE FORMS
•
STAMPINGS

ACCURATE SPRING MANUFACTURING CO.
3811 W. Lake Street
Chicago, Ill.

American Iron and Steel Institute Meeting

(CONTINUED FROM PAGE 53)

any telephone in this or any other country can be reached from the one on your desk, while every radio set can receive practically any broadcast program.

"The can manufacturers and pack-

ers have applied the principles of standardization to advantage in their respective industries. The vast majority of containers used for staple food products such as corn, peas, beans, tomatoes, and various fruits are now

practically standard, as to size, throughout this country.

"Even in our homes, designed and furnished to gratify our individual tastes, we accept without much reflection the benefits of standardized sizes of brick, lumber, pipe and fittings. Only by virtue of standardization is it possible to connect a hose bought in Chicago to a faucet manufactured in New York. The happy age has arrived when a bridge lamp or toaster may readily be attached to any electrical outlet available in a modern building. We accept these conditions without thinking about how they came to be, yet are annoyed when some one departs from standard practice and installs the hot water tap on the right instead of the left-hand side of a lavatory.

Cuts Automobile Costs

"Think of what standardization has meant in the automotive field in this country, where motor vehicles are built and used on an enormous scale. The selective transmission, for example, is standard for all passenger automobiles and there is no confusion in shifting gears, regardless of what car is being driven. In the matter of locating the steering wheel on the right or left-hand side of the car, the practice is uniformly in favor of the left.

"Tires have been standardized so that the various necessary sizes are available at almost every crossroads, and at a reasonable price. Yet none of the foregoing features has interfered in any way with remarkable advances in quality, style, or technical development.

"None the less important to the consumer is the standardization worked out and applied by the automobile manufacturers in their processes of mass production, with interchangeability of parts. The moderate cost of motor vehicles is a reflection of the effective measures adopted. As to variety of models available to the purchaser making a selection from any line of cars, it is necessarily limited by the measured judgment of the producer, because further diversification of sizes, styles, and finishes would influence costs unfavorably and curtail the market accordingly.

Pay More for Extras

"Standard models in any year are available at standard prices, but if a fastidious customer wishes to humor himself by indulgence in something special, he must pay a special price for it. It is hardly possible that any one

Special Gairing Tools

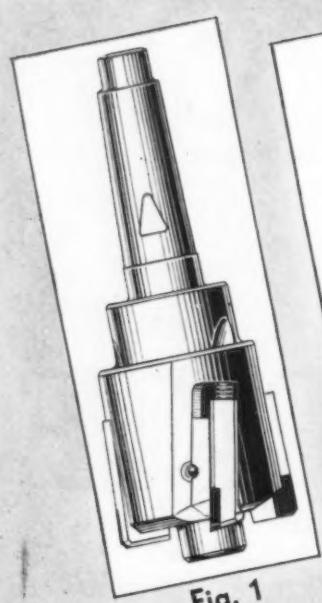


Fig. 1

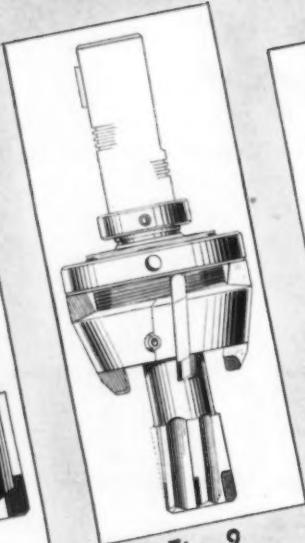


Fig. 2

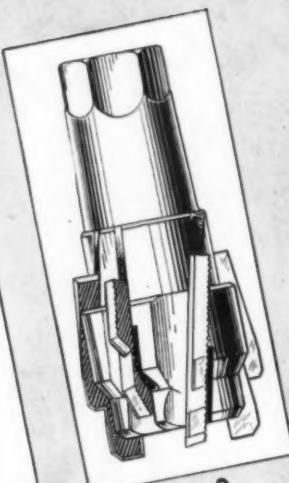


Fig. 3

Designing and building the tools required for complicated end-cutting operations is our particular job. The examples illustrated here are typical of hundreds of "specials" produced under the critical eyes of Gairing engineers.

Fig. 1 - Boring tool with two-way adjustable non-serrated blades, cemented carbide tipped. Fig. 2 - Hollow Mill and Facer with adjustable length core drill, cemented carbide tipped. Fig. 3 - Gair-Lock Multi-Diameter cutter with inserted sub-land blades.

May we assist you?

The Gairing Tool Co., Detroit, Mich.
In Canada. Hi-Speed Tools Ltd., Galt, Ont.

SPECIALISTS IN FINE CUTTING
TOOLS FOR 21 YEARS

in this audience will disagree with the thought that the principle here involved is right and just, and that it operates to the benefit of both the industry and its customers.

Technical Societies Help

"Over a period of years, various factors relating both to manufacturing procedures and products have been systematized or standardized. Methods of sampling and analysis, testing for physical properties, determination of rational tolerances in gage and shape, and standards of surface finish are typical of the many matters which have been accorded painstaking attention. In the consideration of current standards for these features, the steel industry continues to desire close collaboration with its customers, whose sympathetic cooperation is essential to the continuance of economic standards.

"In the matter of determining upon specifications for numerous steel products, both the consumer and the producer have had the effective assistance of various technical societies and the National Bureau of Standards, in addition to that of interested trade associations.

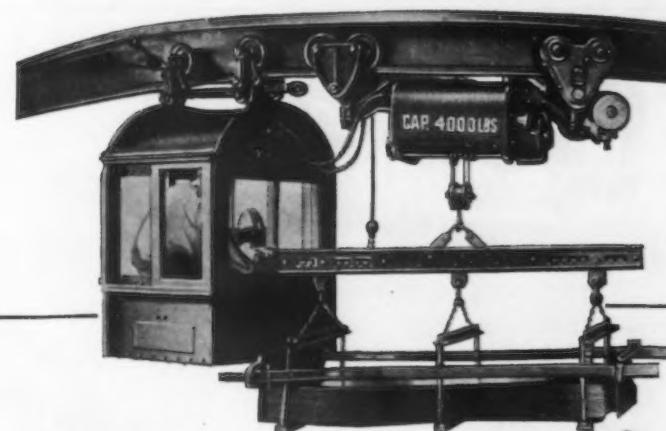
"Experience in the matter of standardizing products, insofar as it has gone, has shown desirable results," said Mr. Fairless. "The recitation of only a few of so many possible examples will serve to illustrate the case. Structural sections, particularly the wide flange beams, have been standardized so that the respective members of the geometric series, although produced by different companies, are interchangeable.

"The vast savings and convenience accruing to the users of structural steel, as a result of these measures, are most pronounced. In addition, the standard dimensions which provide for all engineering requirements, without appreciable gaps, make for economy in production. It is probably safe to say that 90 per cent of the structural steel and plate now produced is manufactured under not more than ten different specifications, and further that approximately 75 per cent of the structural steel is produced under two specifications. A similar story may be told of the growth in the use of steel sheet piling, which was limited and costly until the importance of standards was understood. When standards for steel piling designs were developed, after careful engineering analysis to be the most efficient designs, the use of steel piling increased by leaps and bounds.

"In the case of rails, although there are numerous sections produced to meet the different requirements of railroad service, the standardization of length has been a powerful factor in the economy of production. Any departure from standard affects one operation after another in the rail mill and extends its influence as far back as the open hearth department, where the provisions of ingot molds of appropriate size must be taken into consideration. The rail makers know, from

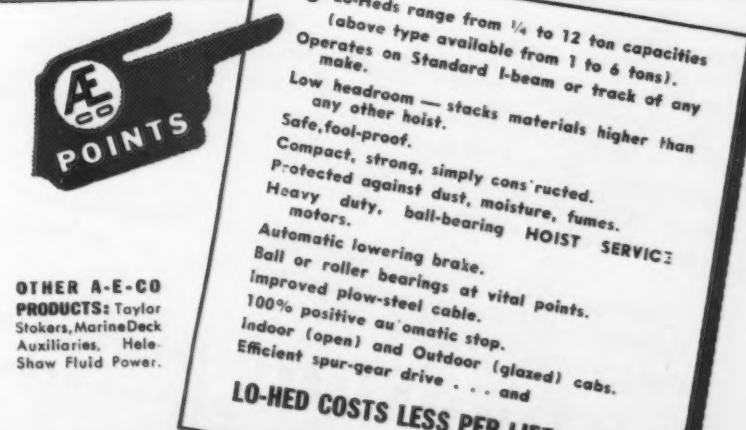
quantitative studies, that even a change in the standard would entail substantial expense. More impressive still is the additional cost of producing a variety of specified lengths when the equipment and practice are adjusted to the standards generally followed.

"A special significance inherent in the subject arises from the fact that consumers nowadays frequently call upon different sources for their supply of a given steel product, but still must realize identical performance in



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their manufacturing operations or installations, regardless of the source of the material.

"Any thought of proceeding to absurd lengths in the matter of standardization is beyond consideration. The universal steel, that is, a single grade to meet all requirements in every field, has not yet been found, and is probably as remote from realization as the fantastic "universal solvent." Standardization is desirable only insofar as it provides against unnecessary and unprofitable diversification of products,

but at the same time allows for useful variety. Moreover, it must be dynamic, not static, so that it may not in any way obstruct improvement and progress. The record shows that it does not. As early as 1895, the Association of American Steel Manufacturers developed a set of standards covering the chemical and physical properties of structural and rivet steel and boiler plate, as then produced. Those standards did not stand in the way of continual advancement, and were superseded when and as they became

obsolete. In practically all cases, whenever practice improves or new requirements are to be met, existent specifications are revised to meet the situation.

Results in Smaller Orders

"Diversification tends to diminish the tonnage involved in any one item scheduled for production. Needless diversification and the small order walk hand in hand. The steel producer is not at all unappreciative of small orders, particularly when conditions are such that they may be combined and consolidated for execution at the mill.

"A hundred relatively small orders involving only a few standard products need not present a serious problem as to melting, rolling, or processing, but as variety increases, the expense of production mounts rapidly. To roll five tons of a certain selected shape costs \$8.80 more per ton than to roll 100 tons, in another case the increase amounts to \$12.95, and in a third instance to more than \$15 per ton. The figures applying to one ton, as against 100, or 50, or even five tons, are almost startling although not entirely unexpected, for the differentials in rolling-costs alone often equal or exceed the selling prices. When the expense of supplying steel of a special composition is added to the excess in rolling-cost, the results are still more unfavorable.

Yielding to Enchantment

"One of the puzzling aspects of technical standardization in the steel industry, as relating to products, is that in some respects the standard has been used, on occasions, as a reference point from which to drift, rather than as the marker of a course to be pursued.

The departure has not always been beneficial to both producers and consumers, yet the additional grades of extra products have persisted, and by gradual multiplication have built up a complex structure which might well be simpler. At times it is possible that the desire to excel with something different just because it is different, has resulted in a yielding to enchantment, the consequences of which have been a temporary benefit, but a long range loss.

"This discussion is not in any sense a plea for the elimination of a single grade, size, shape, or finish which serves a useful purpose in industry or contributes to its advancement. It is solely a statement of the fact that the features to which attention has been called entail added expense."

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No matter how you cut a Johnson UNIVERSAL Bronze Bar, you will find it entirely usable from end to end. Complete Machining — inside diameter, outside diameter and ends — provides a saving of 25% in weight and guards against hidden defects or sagging cores. Now you order bar bronze according to the finished bearing size with only a $\frac{1}{4}$ " cut remaining.

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Sleeve BEARING HEADQUARTERS

Arthur Roeder Says Good Will of Labor and Public Are Essential

ATTACKS upon the structure of American business will lose their effectiveness if each industrial organization wins the good will of the public and the confidence and loyalty of its own employees, Arthur Roeder, chairman of Colorado Fuel & Iron Corp., told the American Iron and Steel Institute.

The first requisite of a sound public relations policy is to make sure that a company's "private performance squares with public profession," Mr. Roeder said in an address delivered for him before the institute's general meeting. No industry, he said, can afford to preach one thing and practise another.

Since industry's problems have broadened and multiplied greatly in recent years, the manager of an enterprise can no longer regard himself as an "expert" in all phases of his business, said Mr. Roeder. However, he continued, management must have the ability to maintain harmony within the organization and obtain the goodwill of the outside world.

Goodwill Needs Cultivation

"One of the distinguishing marks of good management is its insistence upon holding at one and the same time the rights of all," he said. "This will mean eternal regard for the welfare of the workers, the distributors, the stockholders, and the consumers.

"The words—harmony and goodwill—are, of course, intangibles, but they can be put down on paper, and they can be secured. They are realities based on action and attitude. They must be cultivated as one of the greatest assets of any business," he said.

"In a general way, favorable opinion is based on a tripod, like a surveyor's transit. For example, if Jones has a high regard for Smith, the chances are that it is because of something communicated by Brown. This is true not only in business, but for political aspirants and for institutions.

"Strangely enough, the reverse of the formula is not true. Unfavorable opinion does not work according to the rule. Criticism does not carry from Smith to Brown to Jones, but is more likely to rebound on Smith.

"If our assumptions so far are correct, what procedure shall we adopt to set up the chain of goodwill that will communicate itself throughout the organization and to the public? The pro-

gram must start with the employer's attitude toward labor.

First Thought Is Wages

"Mention labor relations to the man in the street. Ten to one he will first think of wages. After this, not necessarily in this order, will follow pension plans, group insurance, unemployment benefits, safety and medical care.

"All of these are important. Some are indispensable, but are they the real basis for sound industrial relations? I

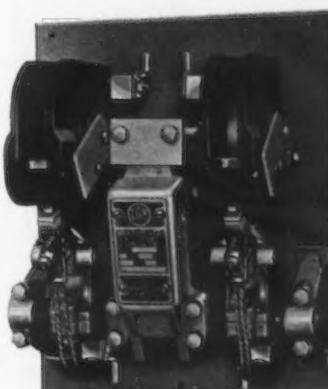
think not. Something far more fundamental must lie back of our program. Industrial relations are basically human relations. Their soundness must, therefore, depend upon man-to-man attitudes. Management can have the respect, confidence, loyalty and sympathy of employees—yes.

"Such a basis is not easy to achieve. It must extend throughout the entire organization. A major, or even a minor executive with negative attitudes in this regard will tend to nullify the

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progressive work of those with the proper spirit.

There Goes the Boss

"Every leader in the group must understand that it is futile for any man to say, 'I am the boss.' But when one worker turns to another and says, 'There goes the boss,' that means something. And when he turns and says, 'There goes that old blankety blank,' that means something too—something quite different. If such a spirit is in

the plant, it means that much of the cost of an extensive program of material employee benefits is being wasted.

"Once our problem of employee relations is solved it is time to consider our attitude toward the outside world—our broader public relations. Here again we are dealing with individuals. And here we must proceed with even more deliberate, thoughtful planning. To define the public relations campaign: it should consist of interpreting

the public to the company and the company to the public.

Human Relationships

"Public relations, like the labor program, is made up of human relationships. The chief difference is that one deals with the employees and the other with the outside world. Here again the whole program depends on mutual faith and trust. Any inconsistencies in the relations between the company and the public are brought about by the deviation of the corporate policy from the public interest. For sound public relations depend upon the alignment of company interests with those of the public.

"Therefore, the next step must be to discover what these two interests are. The public view must be measured, not in a biased or preconceived way, but fairly and truthfully. Next the company objectives must be carefully studied. Every point of coincidence in these two views should then be followed through, for herein lies the secret of a permanently successful program," Mr. Roeder said.

"Many techniques," he continued, "are available for interpreting the company to the public. The actual procedure will vary with each organization. A hundred different activities may develop. Public addresses by company executives, interesting annual reports, statements that make clear company policies—all these may be part of the program. Like charity, good public relations should start at home, in the plant and in the community surrounding the plant.

Merely Outward Symbols

"In the community the corporation may provide assistance to worthy charities. It may sponsor an interest in local and broader fields of social, business, religious and good government movements. Employees may be encouraged to use their talents in outside activities. All of these, of course, tend to build in the mind of the public an attitude toward a corporation.

"But whatever form the actual steps in the program take we must remember that they are merely outward symbols of an inner desire. They cannot be called in themselves a public relations program. That term describes the corporate consciousness of the public interest, and the company determination to adjust its own objectives to the broader view.

"To sum up our suggested course of action: Let the management of each company realize the need for the establishment of sound 'human relations' in all of its dealings."



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Snap! Screw will jump and be firmly held at the bronze or brass spacer. Steel spacers short circuit magnetic lines of force weaken the magnetic pull. Bronze spacers preserve magnetic strength — assure a stronger pull.

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Seasonal Variations in Steel Output Reflect Users' Demands

SEASONAL variations in steel output production have become more marked in recent years, particularly in the period 1929-1937 when consumer goods industries gained much ground among outlets for steel at the expense of heavy industries. This is indicated in a study of steel output by the American Iron and Steel Institute.

There has also been a change in the months in which high or low output prevails, the year's peak now coming generally in the spring rather than in the autumn.

A seasonal pattern calculated for the period 1906-1914, inclusive, shows less variation from month to month than do patterns similarly calculated for the periods 1920-1928 and 1929-1937, inclusive.

The 1906-1914 period was characterized by two well-defined peaks occurring in March and October. Troughs appeared in February, July and December. March and October peaks also occurred in the 1920-1928 period. Low levels were February, July, September and December.

The March peak still persisted from 1929 through 1937, but to a less marked degree. The October peak diminished, having been replaced by a small peak in August. A major peak nearly as important as the one in March occurred in May. February was no longer a month of low-level operations, but July and December continued as such.

From 1906 through 1914 when seasonal variations in steel production were in a relatively narrow range, the extensive expansion programs of railroads and the great volume of construction of all types kept rail mills and structural steel mills operating at a high rate of capacity. This continued activity largely counterbalanced the variations in demand due to seasonal factors.

The greater variation in the seasonal pattern for the 1920-1928 period reflects in part the fact that the industry's finishing capacity rose in relation to demand, permitting the production of a larger proportion of the tonnage demanded within the periods when such demands reached their peak. Another factor in increasing the seasonal swing during that period was the rising importance of new industries as the great periods of expansion in rail-

roads and building construction were being completed.

Among the principal causes for the greater spread between high and low months in the 1929-1937 period are the

still greater capacity of both the steel industry and its consumers, as related to demand, which continued to facilitate the cramming of production for peak demands into shorter periods. In addition, the continued rise of consumer goods, the demand for many of which, such as automobiles, containers, refrigerators and the like, exhibits strong seasonal influences, has introduced new characteristics into steel markets.



Steel Mill engineers laid down the specifications for an ideal ram truck, to embody all the requirements of the modern strip mill for efficiency, safety, and economy. Baker designed and built the Type JO-150 specifically to meet these exacting requirements. It sets new standards of performance for steel handling equipment—and emphasizes once more the fact that handling costs can be and are being cut with Baker trucks.

Features included in this new ram truck are power steer, full contactor control with automatic acceleration, frame of high carbon steel plate, hydraulic wheel brakes, strongest drive axle ever used, easiest accessibility to all units.

Model JO-150, capacity 15000 lbs., 540,000 inch lbs. Wheel-base 73", outside turning radius 115 inches. Turns with maximum coil in intersecting aisles 104 inches wide. May be furnished tilting or non-tilting. Tractors of similar design are available in capacities from 8000 lbs. to 30,000 lbs.



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THE NEWS IN BRIEF

Briggs strike hits automobile production last week, and this week's output will also be affected by holiday shut downs. . . . Price cutting on steel may hurt motor car sales.—Page 65.

Possibility that Roosevelt is seeking third term frightens business.—Page 70.

Maritime Commission lags in 50-ships-a-year program.—Page 72.

LaFollette holds all companies will welcome industrial espionage bill.—Page 72.

Standards Bureau announces new method for measuring machinery wear.—Page 73.

Government steel contracts for latest reported week \$545,401.—Page 73.

March tin production lowest in five years.—Page 74.

Ordnance Division announces awards under special machinery program.—Page 74.

House-Senate conferees approve larger stocking of war materials.—Page 74.

ICC suspends midwest truck schedule on brass, bronze, copper sheets.

Seasonal variations in steel output reflects variations in consumers' demands.—Page 85.

Fabricated steel orders increase sharply in April.—Page 90.

Aluminum Co. of Canada to build \$1,000,000 plant.—Page 90.

Stitching wire calculator for use in determining amount of wire required for any stitching job.—Page 90.

Britain needs scrap as its production of steel expands.—Page 92.

Spending spreads fear, Lammot du Pont warns.—Page 93.

Porcelain Enamel Institute plans fourth annual forum at Columbus.—Page 93.

Senate rail measure exempts Great Lakes ore and coal carriers.—Page 94.

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MEETINGS

May 22 to June 8—Society of Automotive Engineers, world congress, in various cities.

June 5 and 6—Associated Machine Tool Dealers, Schenectady.

June 19 to 22—American Electroplaters' Society, Asbury Park, N. J.

June 26 to 30—American Society for Testing Materials, Atlantic City, N. J.

Aug. 28 to 31—American Mining Congress, Salt Lake City.

Sept. 20 to 22—National Industrial Advertisers Association, New York.

Sept. 26 to 29—Association of Iron and Steel Engineers, Pittsburgh.

Oct. 23 to 27—National Metal Congress, Chicago.

Netherlands buys more tin plate from the U. S.—Page 94.

140 vessels plying Great Lakes in ore trade.—Page 94.

Carbolooy Co. concentrates plant facilities at Detroit.—Page 95.

Welders see seaplane manifolds made at Pittsburgh meeting.—Page 95.

Norton Co. and Farrel-Birmingham Co. hold open house for public.—Page 95.

A.S.M.E. prepares for semi-annual meeting July 10 at San Francisco.—Page 95.

Carnegie-Illinois Steel Corp. merges tin plants in Shenango Valley.—Page 95.

Harnischfeger Corp. completes unique all welded gantry crane.—Page 96.

Gov. Heil urges National Metal Trades Association to enter politics.—Page 96.

Summer upswing not likely, buyers told.—Page 103.

Labor got 40½c., taxes 5½c. of each steel sales dollar in 1938.—Page 103.

Steel centers and Detroit pay highest wages in industry.—Page 114.

Strike at Briggs plants in Detroit may be a prolonged struggle involving a fight between unions and the open or closed shop issue.

Complete tests in England of all-welded model of plate girder.

Arthur G. McKee & Co. to reconstruct Inland Steel blast furnace.

Youngstown Sheet & Tube Co. pays regular preferred dividend.

SPECIAL DELIVERY

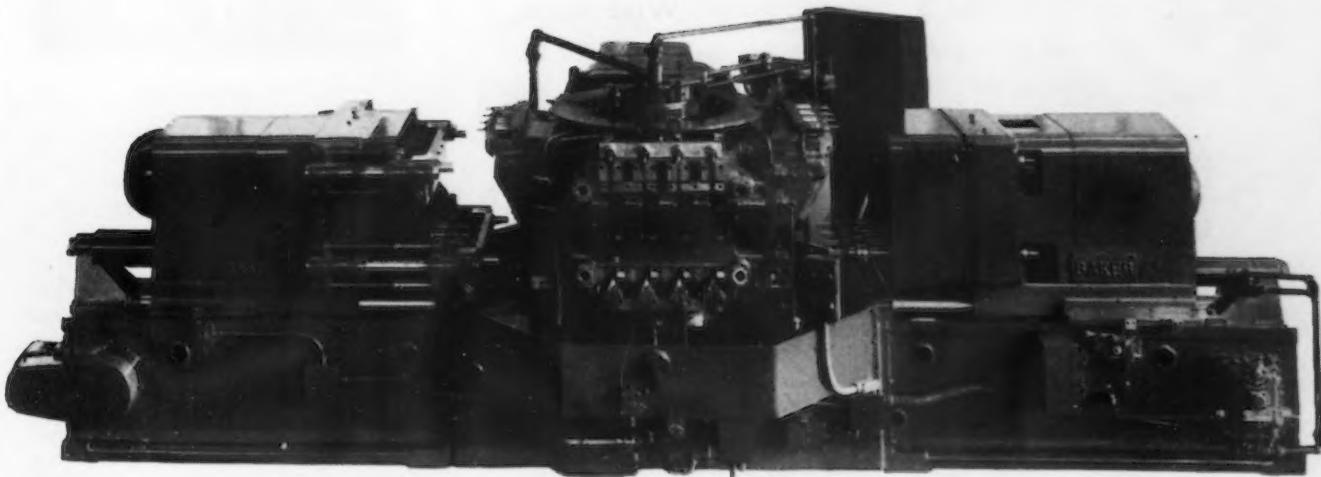
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... OBITUARY ...

WILLIAM CLIFFORD STEVENS, since 1930 vice-president in charge of engineering and secretary of Cutler-Hammer, Inc., Milwaukee, died on May 15, aged 55 years. He became identified with the company in 1906 after his graduation from Cornell University. He was connected with the sales department successively as district manager of the Western division, Eastern district manager, and in 1917 returned to Milwaukee as general sales manager. In 1924 he was placed in charge of the development department and six



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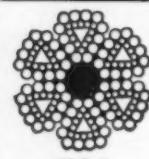
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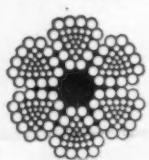
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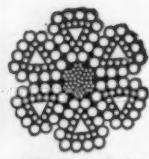
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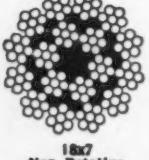
Flattened Strand



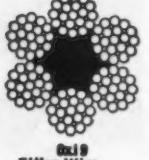
Wire Rope Center



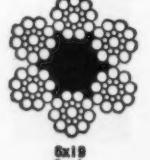
Steel Cored



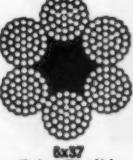
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Non-Rotating



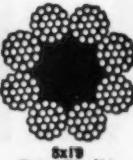
8x19
Filler Wire



8x19
Scale



8x17
Extra Flexible



8x19
Extra Flexible

years later was made vice-president in charge of engineering.

* * *

CLINTON W. HOWARD, for the past 20 years vice-president and sales manager of the Rickert-Shafer Co., Erie, Pa., died on April 19.

* * *

WILBUR J. WATSON, noted Cleveland bridge designer, died after a short illness on May 20, aged 68 years.

Mr. Watson designed many spans and factories in Ohio. The large Goodyear Zeppelin dock in Akron, which was built without center columns, was one of his most outstanding feats. Recently he had designed the Goodrich and Firestone exhibits at the New York World's Fair.

He received his degree from Case School of Applied Science, Cleveland, in 1898, and became a bridge engineer for the New York Central Railroad. In 1907 he formed his own firm.

FRANK W. TUFTS, sales promotion manager, Continental Steel Corp., Kokomo, Ind., died May 24, after an emergency operation for appendicitis. A graduate of the University of Michigan, he was at one time advertising manager of Detroit Steel Products Co., served as advertising counsel for Nash Motors and was with General Motors Export Division in New Zealand and Australia. He had been with Continental Steel for the past four years.

♦ ♦ ♦

WARREN S. BREED, a mechanical engineer, for eight years with a malleable iron company in Detroit, and for another eight years with the Pontiac (Mich.) Lighting Commission, was buried May 22 at Detroit. He retired from business 13 years ago because of ill-health. He was 67 years old.

♦ ♦ ♦

KENNETH E. PORTER, district sales manager at Cleveland for Pittsburgh Crucible Steel Co., died May 24 in Lakeside Hospital. For many years he was in the roll sales division of Carnegie-Illinois Steel Corp., and later was associated with Ludlum Steel Co. In 1921 he went to Cleveland as assistant general sales manager for Pittsburgh Crucible.

♦ ♦ ♦

WALTER J. MILLER, who left a position as works manager of the American Steel Foundries, Pittsburgh, four years ago to go with the Keokuk Steel Casting Co., Keokuk, Iowa, died last week at Mercer, Cal.

♦ ♦ ♦

FREDERICK P. TESSMER, manager and treasurer of the Tessmer Machine & Tool Co., was buried May 24 in Detroit. Born in Germany in 1875, Mr. Tessmer was a resident of Detroit for 60 years. He was a member of the Board of Commerce and the American Foundrymen's Association.

♦ ♦ ♦

JAMES E. LEWIS, chairman of the board of Harbison-Walker Refractories Co., Pittsburgh, died May 25 at his home in Pittsburgh. Mr. Lewis had formerly been president as well as chairman of the board, but had resigned the presidency because of ill health. He was 65 years old.

In 1902 he was head of the Hays works of the Woodland Firebrick Co., which subsequently became affiliated with Harbison-Walker. He became general superintendent and then assistant to the vice-president in charge of all works. In 1913 he was appointed vice-president and manager and in 1920 was named president. Mr. Lewis was also a director of the American Refractories Institute.



Continental's 14 styles of steel roofing and siding are made of special analysis or full copper-bearing steel... all carry a heavy zinc coating applied by the Superior galvanizing process:

CONTINENTAL CONTINENTAL STEEL CORPORATION

KOKOMO, INDIANA

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OPEN HEARTH STEEL SHEETS

Black, Galvanized, Special Coated... Roofing and Siding: "Tyl-Lyke", "Drain-rite", "Aqua-tite", 2, 3, and 5 "V-Crimp", corrugated, roll roofing, etc.

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Durichlor Pump
saving money
by the gallons!**

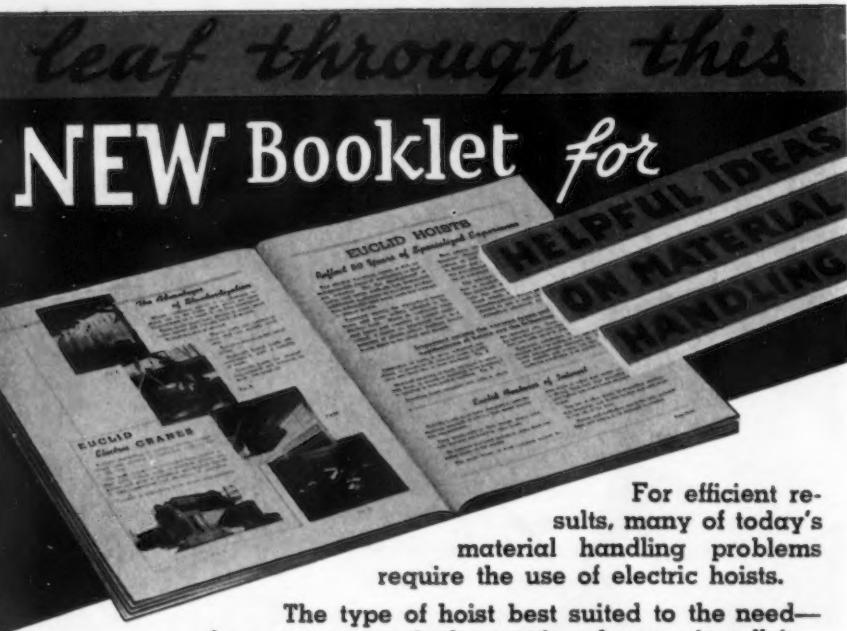


And not only this one Durichlor pump but also the mate to it, each of them handling 350 g.p.m. of muriatic pickle liquor. Two other Durichlor pumps, of a larger size, are each handling 500 g.p.m. of the waste pickle liquor.

They save money by the gallons because they are efficient and not affected by corrosion—Durichlor is highly resistant to muriatic acid in all concentrations and at all temperatures.

Durichlor (and Duriron) centrifugal pumps for use with corrosive liquors are available in sizes from 1" suction, 1" discharge to 10" suction, 8" discharge. Technical bulletins on any of them will be sent you on request.

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The type of hoist best suited to the need—the most economical capacity—how to install it—the kind of control most satisfactory and other related questions always present themselves when new equipment is considered.

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&
HOISTS**

Fabricated Steel Orders Gain Sharply in April

BUYING of fabricated steel in April was in substantially better volume than in the preceding months, according to data compiled by the American Institute of Steel Construction and the Department of Commerce.

The former reports that fabricated structural steel bookings in April were 116,801 tons, a gain of 21,736 tons over the preceding month, and the highest monthly total this year. In April, 1938, bookings amounted to 91,158 tons. Aggregate orders for the current year through April total 396,297 tons against 312,879 tons in the comparable period of 1938.

Fabricated plate orders in April gained 6060 tons to 35,844 tons, according to the Government bureau, the highest since March, 1938, and comparing with 21,958 tons in April, a year ago. Total new plate orders placed in the first four months of this year amounted to 109,042 tons, as compared with 101,250 in the comparable period of 1938.

\$1,000,000 Aluminum Plant for Toronto

TORONTO, Ont.—Aluminum Co. of Canada, Ltd., subsidiary of Aluminum Ltd., will erect a new plant in Toronto to cost \$1,000,000 with further expenditure of \$1,000,000 for equipment. The new plant will produce various products already being produced in this country as well as aluminum shapes for airplanes. Products of the new plant also will embrace the classification known as "strong" alloys, hitherto not made in Canada. Hamilton Bridge Co. has been awarded contract for structural steel at cost of \$400,000. Decision of the company to proceed with the erection of the new plant follows evidence that continued British and Canadian government orders for Canadian made airplanes now are assured.

Stitching Wire Calculator

GEORGE W. PRENTISS & CO., Holyoke, Mass., has prepared for free distribution a calculator to be used in determining the amount of wire required for any stitching job. Knowing the size of wire and the length of wire in each stitch, it is possible to read directly with one setting of the central disc the number of stitches in a pound of wire or the number of pounds in 10,000 stitches.

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ANY METAL-ANY PERFORATION

**The Harrington & King
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CO.**

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PERSONALS . . .

(CONTINUED FROM PAGE 79)

the manager at Ashland; W. F. JOHNSTON as assistant to the general superintendent at the Middletown plant; and J. W. PATON, special representative in charge of Armco's extensive properties at Ashland.

♦ ♦ ♦

C. C. DECK has been appointed superintendent and H. F. BRIER, assistant superintendent of the Gary works rail mill of Carnegie-Illinois Steel Corp. In his new position Mr. Deck succeeds the late Grant Monk.

Mr. Deck has been associated with the corporation since 1919 when he began as a special electrician at its Joliet works. After serving there until 1934, he was transferred to the South Chicago plant as a test engineer and worked in various capacities until his transfer to Gary works as assistant superintendent of the rail mill on March 16 of this year.

Mr. Brier, who succeeds Mr. Deck, began at Gary works in 1918 after serving for a number of years with the Lemont Limestone Co., Lemont, Ill. Since that time he has been employed as rail mill inspector, section inspector and operator and mill foreman until Feb. 1, 1939, when he was appointed general mill foreman of the rail mill.

♦ ♦ ♦

JOSEPH C. ELLIFF, who resigned recently as Western manager of the *Saturday Evening Post*, will join the Stewart-Warner Corp., Chicago, on June 15, in an executive sales capacity, working out of the office of the vice-president and general sales manager.

♦ ♦ ♦

MYRON C. TAYLOR, director and former chairman of the board of the United States Steel Corp., is recovering from an operation of the gall bladder which he underwent at the Harkness Pavilion of the Medical Center, New York, on May 25.

♦ ♦ ♦

E. KENT HUBBARD, president of the Manufacturers Association of Connecticut, has been reelected chairman of the board of the National Industrial Conference Board, New York.

♦ ♦ ♦

I. A. YOST has been appointed manager of engineering for the lighting division of Westinghouse Electric & Mfg. Co. at Cleveland. Mr. Yost has been with Westinghouse since he was graduated from Penn State College in 1924 and has specialized in flood lighting and airport lighting. He went to Cleveland when his division was moved from South Bend, Ind., in 1930.



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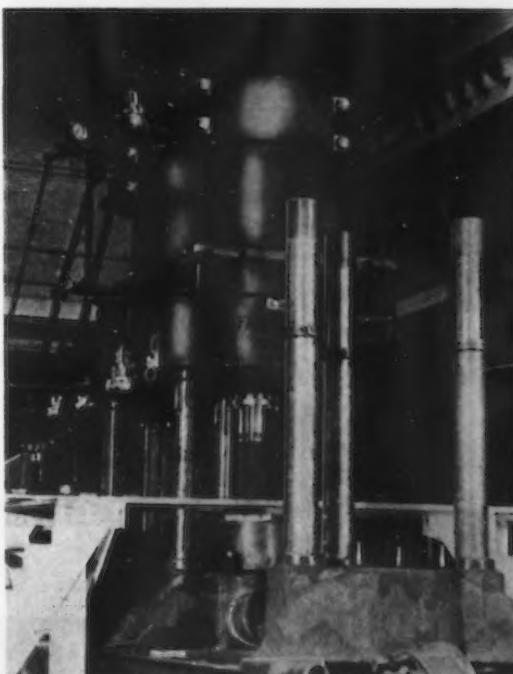
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THREE of one order
T for 144 hydraulic
presses, now under
process of construction
in the Farquhar plant,
soon ready for delivery.

Many industries, such as Westinghouse, Chase Brass & Copper, American Chain & Cable and The McKay Co., have found that built-to-specification Farquhar Hydraulic Presses stamp down excessive production costs. Our engineers would be glad to show you how it's done. Give them a call.

Food-Purchasing Power of Steel Wages in U.S. Highest in World

THE food-purchasing power of the wages of steel workers in foreign countries last year was generally lower than in the year before. The purchasing power of American steel workers' wages, which are the highest in the world, was slightly

higher in 1938 than in the preceding year.

This comparison of the food-buying power of steel wages here and abroad was made by the American Iron and Steel Institute from data published by the International Labor Office.



**PERM-A-CLOR
PRICES REDUCED
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**HIGHER MARGIN OF
SAFETY**
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LONGER LIFE
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**HIGHLY STABILIZED
CHLORINATED
SOLVENT**

**EXTRA Ingredients
enable
PERM-A-CLOR
to solve your
"Impossible"
Cleaning Problems!**

THIS degreasing solvent was created specifically for those exacting applications where greater stability is a necessary quality.

Its extra stability makes Perm-A-Clor particularly suited to the cleaning of aluminum parts, die castings, and combinations of metals which cause rapid break-down of ordinary solvents.

Perm-A-Clor is non-explosive and non-inflammable. Its price is slightly higher but this is more than offset by its greater factor of safety for adverse operating conditions. It has a longer usable life.

If you have a degreasing job which is giving you trouble, Perm-A-Clor and the free services of a Detrex Engineer will solve your problem. The coupon will bring complete information.

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In both years an American steel worker could buy a basket of staple groceries with the wages from about 1½ hr. of work. In 1938 the wages for 89 min. work at the average steel wage of 83c. per hr. would buy 1 lb. each of bacon, chuck beef, white bread, butter, potatoes and sugar, a dozen eggs and a quart of milk at retail in steel centers. In 1937 the same foods could be bought with the wages for 91 min. work.

By comparison, steel workers in five foreign steelmaking nations would have needed to work from three to nearly five times as long as the American worker to buy the same foods in their own countries.

In France, steel workers had to work 4½ hr. last year to earn enough to buy the above-named list of foods, as against 3½ hr. the year before, while German steel workers had to work 6½ hr. last year compared with 5¾ hr. in the preceding year. Steel workers in Sweden could buy the foods for 4½ hr. work in 1937, but had to work five hr. last year.

Only in England and Belgium, among the principal steelmaking nations for which such data are available, did steel workers in 1938 fare as well as or better than in 1937. Belgian workers could buy the foods with 5½ hr. wages last year, as against almost 7 hr. wages the year before, while English workers in both years required 3¾ hr. of work to earn enough to fill the basket.

Similar data for Russia and Italy were not published last year, but in the year before, Russian steel workers had to work 23½ hr. to buy a similar basket of food, while Italian workers had to work almost 10½ hr.

Pennsylvania Labor Law is Revised

THE Pennsylvania House of Representatives early this week approved drastic revision of the State Labor Relations Law, commonly called the "little Wagner Act." The amendments originated in the State Senate and as the bill now reads, sit-down strikes are outlawed, complaints filed by employers as well as employees are to be investigated, organization of craft unions at the option of the employees involved is provided for, check-off of union dues is prohibited except by a majority vote on a secret

ballot of the employees, and describes as an unfair labor practice coercion of any employee or employer by an employee or group of employees. The Pennsylvania Labor Relations Act affects only intrastate employees and employers and most large steel companies and metal working plants do not come under its provisions. The above amendments were bitterly fought by the CIO organization. Governor Arthur H. James is expected to sign the amended bill over the protests of affiliates of the CIO.

Spending Spreads Fear du Pont Declares

FEDERAL financial policies are assailed by Lammot du Pont in a statement addressed to "Stockholders, Employees and Friends of E. I. du Pont de Nemours & Co."

Asserting that true recovery can be achieved only by the time-tested method of encouraging men to work and capital to produce, the chemical company's president called for an immediate lifting of present tax burdens which, he declared, are confiscatory in their effect. Our spending program, he added, has produced, not recovery, but paralysis and fear. He said:

"In 1932 we were justly appalled by the tremendous increase in Government expenditures which had taken place since 1927; but now our total annual expenditures (excluding interest and debt retirement) are more than double the 1932 figures and more than three and a half times the 1927 figures!

"Our total Federal expenditures, excluding Post Office expenses, for the seven years from July 1, 1932, to June 30, 1939, will amount to more than \$53,000,000,000. This is twice as much as the National Government spent from the time of its creation in 1789 to the end of the fiscal year 1916—a period of 127 years which included all of our wars prior to the World War."

Enamel Institute Plans Fourth Annual Forum

CHICAGO—The forum committee of the Porcelain Enamel Institute met recently here and formulated plans for the Fourth Annual Forum, to be held Oct. 18 to 20 at Ohio State University, Columbus, Ohio.

Members of the committee are F. E. Hodek, Jr., General Porcelain Enameling & Mfg. Co., Chicago, chairman; Dr. A. I. Andrews, Uni-

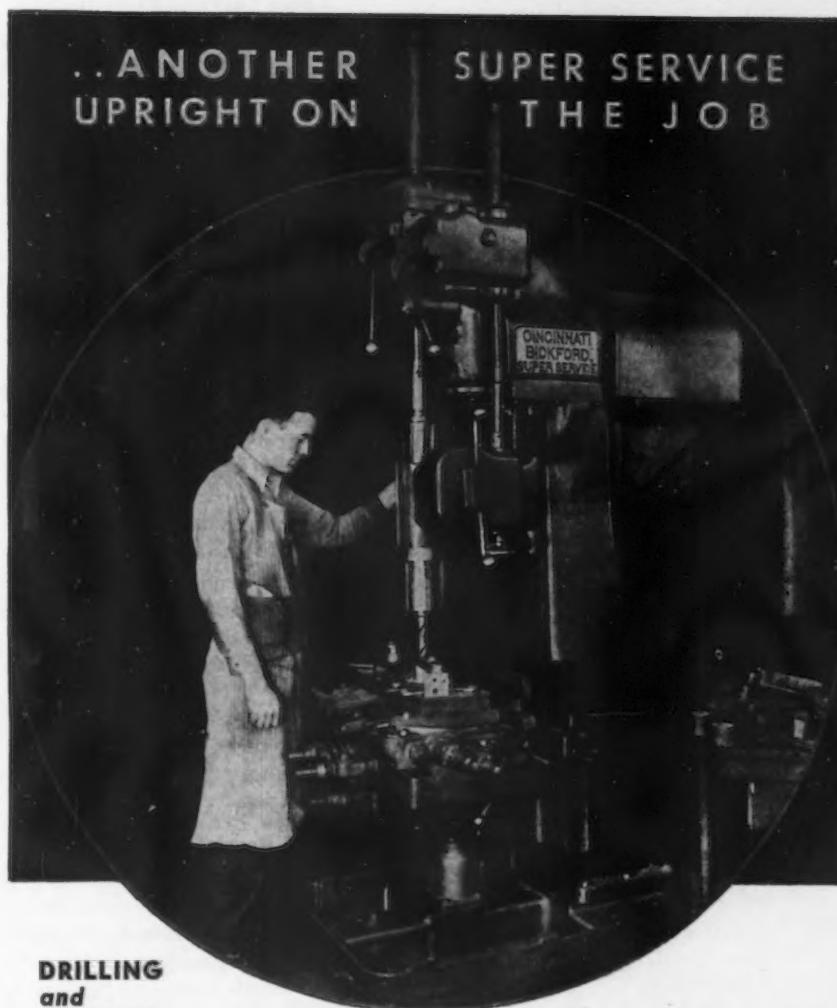
versity of Illinois; J. E. Hansen, Ferro-Enamel Corp., Cleveland, and Prof. R. M. King, Ohio State University.

The opening forum session on Wednesday will be devoted to a symposium on fine-ground enamels. On the following day there will be an all-day session on cast iron enameling. Also on Thursday morning those interested in sheet iron and hollow-ware will meet in a separate section, while in the afternoon there will be several section meetings, among them a session de-

voted entirely to hollow-ware. General sessions, morning and afternoon, are planned for the closing day, Friday, Oct. 20.

Porcelain Enamel Institute headquarters during the week of the forum will be in the Deshler-Wallick Hotel.

The Roots-Connersville Blower Corp. has moved its Chicago office from Room 814, 140 South Dearborn Street, to Room 1027, People's Gas Building, 122 South Michigan Avenue. William Townsend, district manager, with James T. Sutliff, sales engineer, will continue to handle the sale of the company's products in the Chicago district.



DRILLING and REAMING ARE EASILY, ACCURATELY HANDLED

The Pneumatic Scale Corporation, Norfolk Downs, Mass., modernized drilling operations by installing a modern 28" Super Service upright drill with compound table.

The job shown here consists of drilling and reaming 1" holes in a 4"x4"x2" bearing. Accuracy is held to $\pm .004"$.

This user reports the Super Service so easy to handle that it is a time and money saver on even one and two piece lots. You, too, can depend on "More Holes per Dollar" when you take advantage of the adaptability, productivity, accuracy and ease of handling offered in Super Service Uprights. Available in 21", 24" and 28" All Geared Sizes. Write for Bulletin U-22.



THE CINCINNATI BICKFORD TOOL CO.
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Senate Rail Bill Exempts Lakes Ore and Coal Carriers

WASHINGTON—Iron ore and coal carriers on the Great Lakes are exempted from the provisions of the omnibus railroad bill passed, 70 to 6, by the Senate last Thursday. At the same time it leaves unchanged the present commodities clause. Also, a rider offered by Senator Shipstead, Farmer-Laborite of Minnesota, chiefly aimed at steel and oil producers, was defeated but may be introduced later as an amendment to the Federal Trade Commission act, in which form Senator Wheeler said it would have his support. The Shipstead amendment, voted down 54 to 21, was proposed to compel the charging of not more than actual freight rates on shipments of products to given destinations. Specifically it would authorize the Federal Trade Commission to prohibit corporations from establishing delivered prices based on the all-rail costs where shipments are moved by other forms of transportation.

Contrary to published reports the amendment would not strike at the basing point system, except possibly by indirection, since it would not bar quoting prices on a delivered basis. Senator Wheeler, author of the defunct anti-basing point bill, said he was in favor of the "substance" of the Shipstead amendment but that he was opposed to its being tacked onto the rail bill. Ore and coal shipping interests and industries operating railroads had showed considerable concern during hearings on the bill lest, as it was originally written, it would greatly affect them.

Would Extend Regulation

The legislation is an attempt to place on intercoastal, coastwise, inland waterways and Great Lakes common and contract carriers the same type of regulation by the Interstate Commerce Commission that now applies to the railroads and motor carriers. Regulation now exercised by the Maritime Commission would be transferred to the ICC. Considerable opposition against the Senate bill, sponsored by Chairman Wheeler, Democrat of Montana, of the Interstate Commerce Committee, exists on the part of inland waterways shipping interests who will seek complete exemption from the bill when it is taken up on the House side. It is doubted that their efforts will prevail since the measure has administration support, though opposed be-

cause of the regulatory authority it would lose, by the Maritime Commission.

Senator Wheeler said the bill as reported to the Senate provided exemption to bulk lake carriers. But senators from the Great Lakes States were not entirely satisfied with the exemption provision.

Lakes Carriers Exempted

This provision gives the ICC permission to exempt contract carriers by water, which by reason of the inherent or special nature of their equipment and of the commodities transported and their handling in bulk are not actually or substantially in competition with common carriers by water. To make certain of exemption Great Lakes senators successfully supported an amendment by Senator Brown, Democrat, of Michigan, giving specific exemption to bulk carriers on the Great Lakes which come in competition with bulk carriers of foreign registry. Another provision authorized the ICC to exempt water carriers which by reason of regulation would be put at a disadvantage by foreign competition.

Proposed to prohibit "out of pocket" rates, an amendment by Senator Miller, Democrat, of Arkansas, allows the ICC to permit a carrier to make a competitive rate provided it affords a compensatory return after taking into consideration "overhead and all other elements entering into the cost . . . for the service."

Pool Provision Dropped

Railroads were said to be largely satisfied with the bill when the Senate knocked out a provision for compulsory pooling of revenue. The provision was killed upon suggestion of Senator Wheeler after he had "reconsidered" it. The provision would have authorized the ICC to compel pooling of revenue from general rate increases. Another pool provision stricken from the bill authorized the ICC to compel the railroads to handle all less-than-carload freight through a joint agency or agencies. The so-called through routes provision was enacted. Supported by short line railroads and opposed by some of the Class I lines, it authorizes the ICC to require the establishment of through routes and joint rates without reference to the short hauling of any carriers. At present an originating carrier is entitled

to its long haul in connection with through routes.

Responsive to complaints of Southern states governors, the bill carries a provision directing the ICC to investigate interterritorial rates. Also incorporated in the measure is an amendment to the section relating to discriminations which makes discriminations between territories or regions unlawful.

Upon passage of this bill, which is meant to relieve railroad competition with other forms of transportation, the Senate took up the Wheeler-Truman bill. The purpose of the latter is to facilitate reorganization of distressed railroads by means of a proposed Railroad Bankruptcy Court.

Netherlands Buying More U. S. Tin Plate

WAshington — The Commerce Department reports that the United States in recent years has become a leading supplier of tin plate to the Netherlands where 54 manufacturers of tin cans and tinware consume tin plate at the rate of 60,000 tons annually. Great Britain supplied more than 90 per cent of the tin plate imported into the Dutch market prior to the World War but Germany in recent years has been offering appreciable competition. In 1933, American tin plate amounting to 96 tons was imported to the Netherlands and this increased to 15,000 tons in 1938. Imports from Great Britain decreased from 32,000 tons in 1937 to 17,000 tons in 1938 while imports from Germany decreased from 25,000 to 16,000 tons, the report said.

140 Ships Ply Lakes In Iron Ore Trade

CLEVELAND — American ore vessel operators had 170 ships in commission May 25, of which 140 were in the ore trade on that date, out of the total fleet of 303, according to the first 1939 report of C. C. Linderman, statistician for the M. A. Hanna Co. here.

The first report last year, issued June 6, showed 123 out of 308 boats active with 87 in the ore trade on that date. The 1939 reports are based on 20-ft. draft against 19-ft. draft for the 1938 reports.

Pittsburgh Steamship Co. had 64 boats in the ore trade on May 25, followed by Interlake Steamship Co. and Cleveland Cliffs Iron Co., each with 14 active.

Carboly Co. Concentrates Plant Facilities at Detroit

NEW consolidated manufacturing facilities put into use when Carboly Co., Inc., formally opens its new plant and general offices in Detroit on June 1, makes the automotive city virtually the center of cemented carbide manufacturing activities in the United States. The new plant is said to be the largest of its kind in the country and the first designed throughout for quantity production of cemented carbide.

All manufacturing facilities, formerly divided among Carboly plants in Cleveland, Detroit and Stamford, Conn., are combined in this new plant. Equipment now installed and planned for the immediate future is said to be capable of producing approximately ten times the amount of Carboly currently consumed by industry. The \$750,000 general offices and factory include a total area of 121,750 sq. ft. with supplementary space provided for considerable expansion in each department of the plant. The plant is located on a 40-acre site in a new industrial area which has developed along East Eight Mile Road on the northerly city limits.

Light Facilities Interesting

A two-story administration building with an area of 35,556 sq. ft. houses all general office departments. This structure is of reinforced concrete, fireproof construction, completely air-conditioned, with acoustical ceilings in halls and offices. The factory, connected with the rear of the administration building, is a monitor type, one-story, all-welded, steel and brick structure covering 88,197 sq. ft.

Lighting facilities and air-conditioning are two of the particularly interesting features of the building. All parts of the factory except the Powdered Metal Department, are illuminated with GE high intensity mercury vapor lights, with 400 watt units placed on 10 x 15 ft. centers at a mounting height of 15 ft. These provide 40 to 50 foot-candles at the working place; 25 foot-candles is considered as average. Alzak reflectors are used.

The Powdered Metal Department contains one of the first installations of the new 100 watt Cooper Hewitt fluorescent lamp made especially for production precision operations. These lamps are placed on 8 x 12 ft. centers at a mounting height of 10 ft. and pro-

vide 40 to 50 foot-candles at the working point.

Departing from conventional lighting methods, all illumination in the office building emanates from ceiling coffers 4 ft. sq. x 15 in. deep. These provide from 25 to 40 foot-candles at the working place. Standard silvered bowl lamps, encircled a few inches away with an aluminum band, hold all direct light within the coffer.

Besides the complete air-conditioning of the office building, various sections of the factory are accorded special treatment, the nature of it depending upon the operation being performed in the department.

Carnegie-Illinois Merges Shenango Tin Plants

SHARON, PA.—Effective June 1, the management of Carnegie-Illinois Steel Corp's Farrell works tin plant here, and the Shenango works tin plant at New Castle, Pa., came under the supervision of Carnegie's Farrell works. F. B. Quigley, general superintendent of the Farrell works, continues in the same capacity as heretofore, as will the assistant general superintendent in charge of steel works, G. W. Humes. C. E. Crawford, formerly general superintendent of Shenango tin works, has become assistant general superintendent of the Farrell works in charge of tin plants. E. R. Thompson has become superintendent of the Farrell tin plant and H. R. Gravenstreeter will become superintendent of the Shenango tin works.

Norton, Farrel-Birmingham Companies Hold Open House

COINCIDENT with the completion of two new plants, employees of the Norton Co., Worcester, Mass., held open house recently for relatives and friends. Visitors, including employees, numbered nearly 7000. In various plants the visitors saw the drying and shaving of pressed wheels and the operation of large tunnel kiln, the reduction of grinding wheels to proper dimensions in the truing department, grading bushing, balancing and testing of wheels, and the inspection and packing of finished grinding wheels. Finally they inspected the exposition of Norton products.

Six thousand people recently visited the plant of Farrel-Birmingham Co., Inc., Ansonia, Conn. The occasion was an open house to provide families and friends of workers and the public a chance to see the inside of the plant, its facilities and the equipment used to produce castings, rolls and heavy machinery.

Welders See Seaplane Manifolds Made

WELDING of an Inconel exhaust manifold similar to that used on the "Yankee Clipper," pioneer Trans-Atlantic air liner was a feature of a recent welding clinic in the new warehouse of Williams & Co., 901 Pennsylvania Avenue, Pittsburgh. These manifolds are made by gas welding No. 19 gage Inconel sheet—0.0043 in. thick. The manifold for each of the 1500-hp. engines used to power the 74 passenger aircraft weighs—when completed—only 80 lb. and must withstand the attack of corrosive gases at 1500 deg. F.

Frank Flocke, welding engineer, International Nickel Co., did the welding of the sample manifold. More than 1400 welders attended the two-day clinic, at which the welding of nickel, Monel, Inconel and other nickel alloys, aluminum, brass, and other materials was demonstrated by engineers of the producing companies.

A.S.M.E. to Hold Semi-Annual Meeting in San Francisco

FOURTEEN technical sessions relating to aeronautics, fuels, heat transfer, hydraulics, power plant engineering, process industries, agricultural engineering, material handling and management are scheduled for Semi-Annual meeting of the American Society of Mechanical Engineers, to be held in San Francisco, July 10 to 15. July 13 has been set aside as Engineers' Day at the Golden Gate International Exposition, at which the Honorable Herbert Hoover will make an address on the contributions which engineering has made to human welfare.

Problems encountered in burning of fuel oil, design and operations of De Florez furnaces, and the characteristics of atmospheric type natural gas burners are some of the topics relating to fuels. Organization and labor problems of branch management, management in the small plant, and the economic considerations of material handling are other topics on the agenda.

Heil Urges Metal Trades Association to Enter Politics

CHICAGO—Four hundred members of the National Metal Trades Association, at their annual convention in Chicago last week, heard many varied subjects discussed, including job rating, Fascist influences in the United States, the future demand for capital goods, politics and industrial relations.

A guest of the convention was Julius P. Heil, governor of Wisconsin, who spoke at the banquet Wednesday night. The governor, a member of the association, urged his audience to have courage in the future and to enter politics. He mentioned the anti-picketing and other labor relations laws passed during his administration thus far, and pointed out the unusual fact that last week the Legislature passed a balanced budget. He said that President Roosevelt was not fit for the Presidency if he could not balance the national budget.

Gov. Heil said that the Wisconsin farmers in his own election campaign were told that the industrialist was their best friend, and he believes that a similar relationship should be developed with all groups.

The regular program opened Wednesday morning with a discussion of "The Use and Application of Job Rating," participated in by A. L. Kress, National Metal Trades Association; E. L. Berry, assistant general manager, Link-Belt Co., Chicago, and Howard Goodman, vice-president, Goodman Mfg. Co., Chicago, Ill.

O. D. Reich, vice-president, Dexter Folder Co., Pearl River, N. Y., chairman of the association's committee on merit rating, told of the committee's work and introduced W. W. Finlay, Wright Aeronautical Corp., Paterson, N. J., who explained the merit rating plan worked out by the committee.

Human Inventory

Mr. Finlay said merit rating was "the taking of human inventory" and recommended the plan to the association for its use. Foremen are employed as raters, and the method used, Mr. Finlay believes, eliminates much of the personal bias. Mr. Finlay said all rating data should be kept confidential from other than the man involved, and that each man should be able to talk to his rater. About six months should be allowed to elapse between ratings, he said. At each rating period, no previous ratings should be available to the rater.

In addition, Mr. Finlay said, when a man improves a bad rating, his poor marks should be destroyed so that he knows the company has no record on hand of his previous rating, and has in mind only his current condition.

The purpose of a rating plan, according to Mr. Finlay, is to increase the effectiveness of supervision, to provide a sound basis for wages, to provide a sound basis for decisions on retention or transfer, to indicate potentialities of workers and provide an intelligent basis for promotion, to help employees correct their faults, to develop among supervisors an added spirit of fairness and impartiality in dealing with employees and to make supervisors more alert, careful, accurate and analytical in judging employees.

Wage Considerations

For the purpose of determining the rate of pay, the following factors are considered: Quality of workmanship, quantity of work, versatility, job knowledge, dependability, and team work. Complete details of this merit rating system and its mechanics may be obtained on request from the National Metal Trades Association, 122 South Michigan Avenue, Chicago.

Nelson W. Pickering, Farrel-Birmingham Co., Inc., Ansonia, Conn., president of the association, in his annual report, emphasized the association's stand for the open shop, and discussed the various principles and policies for which the association stands and the activities carried out in the past year.

Westinghouse Demonstration

At the Wednesday luncheon, Dr. Phillips Thomas, research engineer, Westinghouse Electric & Mfg. Co., Pittsburgh, provided a spectacular demonstration of the results of some of his company's latest research efforts. Among these were the "Precipitron," an electrostatic air filter, the use of polarized light for eliminating glare from headlights at night, the principle of the light relay, a small model of an "atom-smasher," which developed 500,000 volts, and several others.

In the decade of the "forties" America will see the greatest demand for capital goods and will enjoy the greatest prosperity in its history, according to George H. Houston, New York, prominent industrial consultant. The

demand for capital goods, he said, depends on the economic outlook, cost of capital goods and capital, public policies unfavorable to business, and technological development.

Dies Aide Speaks

The former chief investigator of the Dies committee on un-American activities, John C. Metcalfe, advocated swift deportations of alien trouble-makers, militant Americanization programs among naturalized and native citizens and constitutional remedial legislation to deal with those insistent upon inciting un-Americanism.

Management should retain its right of free speech and should not lack courage to express its opinion, said David R. Clarke, Fyffe & Clarke, Chicago, counsel for the association, as the legality of free speech is an established fact.

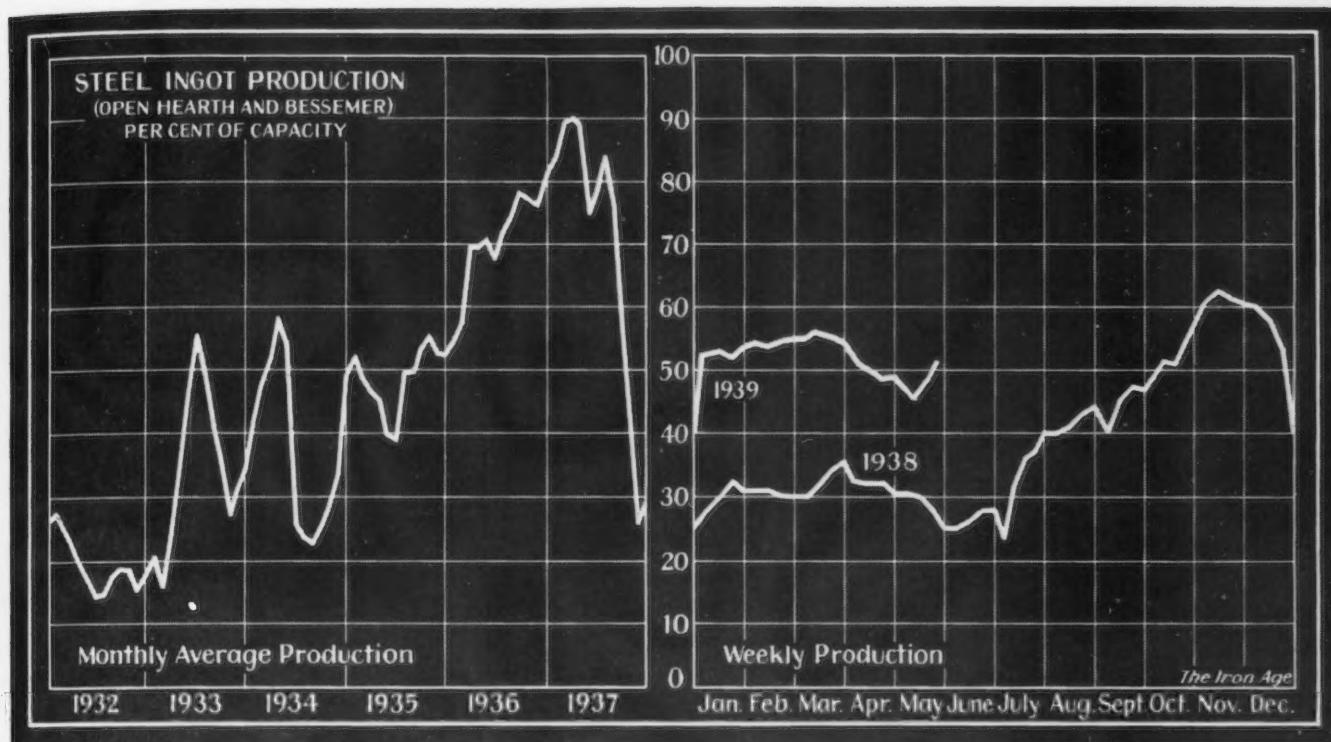
John W. O'Leary, chairman, executive committee, United States Chamber of Commerce, and former head of the Machinery and Allied Products Institute, told of the fogginess of mind and uncertainty current in Washington today. There are two groups there, Mr. O'Leary said, the extremists and the moderates. The former want reform in preference to recovery, while the moderates desire the reverse, recovery and then reform, if reform is necessary at that time. The extremists consider the revision of existing laws a retreat from their position, and accordingly, balk. For business to prosper once more, the revision of the Wagner Act, Wages and Hours Act, Walsh-Healey Act, and much of our other industrial legislation, is advisable, according to Mr. O'Leary.

Names of the officers and councilors of the association for the coming year were published in the May 25 issue of *THE IRON AGE*.

Harnischfeger Completes New All Welded Gantry Crane

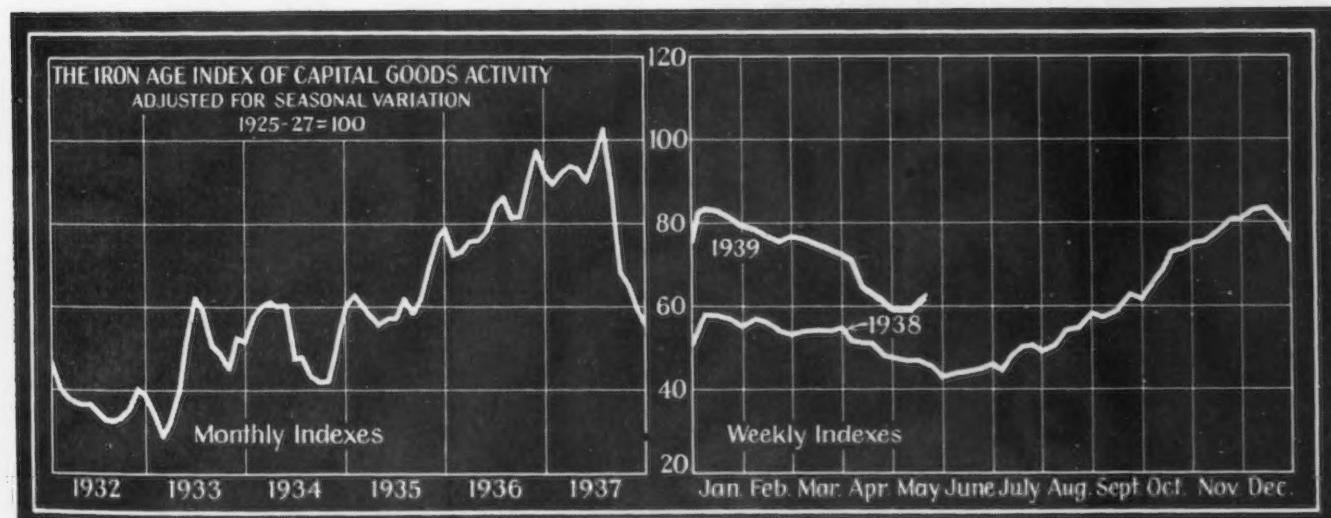
CHICAGO—The Harnischfeger Corp., Milwaukee, recently completed what is said to be the only all welded gantry crane of its type ever constructed. Designed for lifting gates on a large dam, this 20-ton capacity crane measures 22 ft. in height, and required 1250 lb. of $\frac{1}{4}$ in. electrodes. Harnischfeger used its own welding equipment and electrodes in the manufacture of this crane, and say that resultant weight savings will amount to about 25 per cent, and that strength will be increased considerably. The welds have a tensile strength of 60,000 lb. per sq. in., elongation of 25 to 35 per cent in 2 in., and impact resistance of 40 to 60 ft.-lb.

Ingot Production Rises Four Points to 52%



District Ingot Production, Per Cent of Capacity	Pittsburgh	Chicago	Valleys	Philadelphia	Cleveland	Buffalo	Wheeling	Detroit	Southern	S. Ohio River	Western	St. Louis	Eastern	Aggregate
CURRENT WEEK..	41.0	53.5	49.0	33.0	51.0	46.5	65.0	55.0	50.5	53.0	60.0	41.0	50.0	52.0
PREVIOUS WEEK..	36.0	49.0	43.0	33.0	53.0	41.5	56.0	55.0	46.5	43.0	60.0	41.0	50.0	48.0

Resumption of Coal Mining Bolsters Capital Goods Index



RESUMPTION of coal mining and shipping in the Pittsburgh area was chiefly responsible for a slight advance in THE IRON AGE index of capital goods activity in the week ended May 27. This gain, amounting to 1.5 points, marks the second consecutive weekly improvement. Labor difficulties, however, continue to exert an abnormal influence on the index's movements. This time it is the UAW strike in Detroit. The shrinking of assemblies due to this strike drove the automobile series down 9.8 points, or 14 per cent, to the lowest level since Oct. 1, 1938. Were it not for this development, the week's gain in the combined index would have been about 3.5 points. Both the steel production and the heavy construction series moved higher

in the week, the improvement in the latter being traceable to the placing of a large number of private housing projects.

	Week Ended May 27	Week Ended May 20	Comparable Week	
			1938	1929
Steel ingot production ¹	63.2	58.6	35.1	128.0
Automobile Production ²	58.0	67.8	39.2	129.8
Construction contracts ³	74.7	74.0	61.1	130.4
Forest products carloadings ⁴	53.2	54.0	45.9	120.4
Production and shipments, Pittsburgh District ⁵	55.3	42.4	47.7	126.1
Combined index	60.9	59.4	45.8	126.9

Sources: 1. THE IRON AGE; 2. Ward's Automotive Reports; 3. Engineering News-Record; 4. Association of American Railroads; 5. University of Pittsburgh.

SUMMARY OF THE WEEK

... Ingot production in sharpest weekly rise of the year.

... Scrap prices stronger and capital goods index rises.

... Sheet and strip bookings will carry through third quarter.

ALL of the important indices of iron and steel activity, excepting automobile production, have moved upward this week. Ingot output has gained four points to 52 per cent of the industry's capacity; additional blast furnaces that were banked during the recent coal tie-up have resumed, indicating that the May production total, which will be available next week, will exceed that of April; the steel scrap price composite of THE IRON AGE has advanced 13c. to \$14.21, and THE IRON AGE capital goods index has gained for the second consecutive week, now standing at 60.9, or 1.8 points above the low for the year thus far of 59.1 in the week ended May 13, and this has occurred in spite of the shrinkage in automobile assemblies.

The gain in ingot production is by far the sharpest that has occurred in any week this year. This week's rate compares with an average of 54.14 per cent in the first quarter and is within four points of the highest weekly figure of the year—56 per cent in the week beginning March 12. There has been a gain of five points to 41 per cent in the Pittsburgh district, one of four and a half points to 53½ per cent in the Chicago district, six points in the Youngstown district to 49 per cent, nine points in the Wheeling-Weirton district to 65 per cent, 10 points in Southern Ohio to 53 per cent, five points at Buffalo to 46½ per cent, and four points at Birmingham at 50½ per cent. The only loss is a slight one in the Cleveland-Lorain district, due mainly to furnace repairs.

Encouraged by the higher steel operating rates, scrap markets have taken on a tone of strength, even though not much mill buying is taking place. At Chicago brokers are offering \$13 and would probably quote \$13.50 to consumers. At Pittsburgh the range in quotations has narrowed,

while there has been an advance of 50c. a ton at Cleveland and one of 25c. at Youngstown, quotations in the latter market now being higher than those at Pittsburgh, an unusual situation.

Another favorable sign is an expansion in the volume of fabricated structural steel awards, which this week total more than 35,000 tons, largest since the first week of January. They included 20,000 tons for two bridges across the Mississippi River, one at Greenville, Miss., and the other at Natchez, Miss. Although new projects requiring structural steel total only about 16,500 tons this week, the flow of specifications of all building steel to the mills for projects that have been awarded during recent months is probably the largest single factor in current rollings.

Specifications against recent low-priced commitments for flat rolled steel, which are fairly heavy in some districts, are also an important factor. The amount of such steel for which the mills are committed is more than could possibly be rolled during the remainder of this quarter, thus assuring that there will be an ample volume for the mills throughout the third quarter. While the aggregate bookings still cannot be accurately estimated, it is reliably reported that one automobile company covered for enough sheets and strip for 700,000 cars.

It seems certain that the automobile companies will not take the bulk of their commitments until the third quarter. The strike at Briggs plants at Detroit, coming at the end of the 1939 model season and as the 1940 program is getting under way, may postpone completion of the one and delay production on the other. This may tend to create a bulge in steel production in July and August, when it is usually lagging.

Shipbuilding requirements are causing a steady flow of specifications to the mills, and they will be augmented by 9400 tons to be used for eight submarines and eight destroyers that the Navy Department has allocated to its own yards and private builders.

Tin plate orders are sustaining a steady operation averaging 70 per cent, with larger specifications expected during June.

Railroad buying leaves a lot to be desired, but orders have been placed for 20 Diesel-electric locomotives with one company.

Aside from the heavy bookings of sheets and strip in May, a number of other products made a better showing than in April.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

	May 29, 1939	May 23, 1939	May 2, 1939	June 1, 1938
Per Gross Ton:				
Rails, heavy, at mill	\$40.00	\$40.00	\$40.00	\$42.50
Light rails: Pittsburgh, Chicago, Birmingham	40.00	40.00	40.00	43.00
Rerolling billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point	34.00	34.00	34.00	37.00
Sheet bars: Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point	34.00	34.00	34.00	37.00
Slabs: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point	34.00	34.00	34.00	37.00
Forging billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham	40.00	40.00	40.00	43.00
Wire rods: Nos. 4 and 5, Pittsburgh, Chicago, Cleveland	43.00	43.00	43.00	47.00
Skelp, grvd. steel: Pittsburgh, Chicago, Youngstown, Coatesville, Sparrows Point, cents per lb.	1.90	1.90	1.90	2.10

Finished Steel

	Cents Per Lb.:			
Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham	2.15	2.15	2.25	2.45
Plates: Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Clayton	2.10	2.10	2.10	2.25
Structural shapes: Pittsburgh, Chicago, Gary, Buffalo, Bethlehem, Birmingham	2.10	2.10	2.10	2.25
Cold finished bars: Pittsburgh, Buffalo, Cleveland, Chicago, Gary	2.65	2.65	2.70	2.90
Alloy bars: Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton	2.70	2.70	2.80	3.00
Hot rolled strip: Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown, Birmingham	2.00	2.00	2.15	2.30
Cold rolled strip: Pittsburgh, Cleveland, Youngstown	2.80	2.80	2.95	3.10
Sheets, galv., No. 24: Pittsburgh, Gary, Sparrows Point, Buffalo, Middletown, Youngstown, Birmingham	3.50	3.50	3.50	3.80
Hot rolled sheets: Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown	2.00	2.00	2.15	2.30
Cold rolled sheets: Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown	3.05	3.05	3.20	3.35

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

The Iron Age Composite Prices

Finished Steel

May 29, 1939	2.236c. a Lb.
One week ago	2.236
One month ago	2.286
One year ago	2.487

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.

HIGH	LOW
2.286c., Jan. 3	2.236c., May 16
2.512c., May 17	2.211c., Oct. 18
2.512c., Mar. 9	2.249c., Jan. 4
2.249c., Dec. 28	2.016c., Mar. 10
2.062c., Oct. 1	2.056c., Jan. 8
2.118c., Apr. 24	1.945c., Jan. 2
1.953c., Oct. 3	1.792c., May 2
1.915c., Sept. 6	1.870c., Mar. 15
1.981c., Jan. 13	1.883c., Dec. 29
2.192c., Jan. 7	1.962c., Dec. 9
2.223c., Apr. 2	2.192c., Oct. 29
2.192c., Dec. 11	2.142c., July 10

Pig Iron

\$20.61 a Gross Ton
20.61
20.61
23.25

Based on average for basic iron at Valley furnace and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

Steel Scrap

\$14.21 a Gross Ton
14.08
14.25
11.17

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

HIGH

\$23.25, June 21	\$19.61, July 6
23.25, Mar. 9	20.25, Feb. 16
19.73, Nov. 24	18.73, Aug. 11
18.84, Nov. 5	17.83, May 14
17.90, May 1	16.90, Jan. 27
16.90, Dec. 5	13.56, Jan. 3
14.81, Jan. 5	13.56, Dec. 6
15.90, Jan. 6	14.79, Dec. 15
18.21, Jan. 7	15.90, Dec. 16
18.71, May 14	18.21, Dec. 17
18.59, Nov. 27	17.64, July 24

LOW

\$15.29, Mar. 28	\$14.08, May 16
15.00, Nov. 22	11.00, June 7
21.92, Mar. 30	12.92, Nov. 10
17.75, Dec. 21	12.67, June 9
13.42, Dec. 10	10.33, Apr. 29
13.00, Mar. 13	9.50, Sept. 25
12.25, Aug. 8	6.75, Jan. 3
8.50, Jan. 12	6.43, July 5
11.33, Jan. 6	8.50, Dec. 29
15.00, Feb. 18	11.25, Dec. 9
17.58, Jan. 29	14.08, Dec. 3
16.50, Dec. 31	13.08, July 9

THIS WEEK'S MARKET NEWS

PRICES

... Advance of \$1 to large tonnage bar buyers creates confusion

THERE is still some confusion over the recent change in the base price of carbon bars and the elimination of the quantity allowances whereby large buyers are obliged to pay \$1 more a ton. Dissatisfaction among large buyers over this situation appears to be spreading. Whether any move will be made by the mills in an effort to straighten out the matter could not be learned. It seems certain, however, that quantity discounts will not be restored.

NEW BUSINESS

... May orders exceed those of April by good margin

TOTAL specifications in the PITTSBURGH district during May approximated closely the volume booked in April. This excellent showing was due to a combination of a pick-up following settlement of the coal mining stalemate and a moderate increase in flat-rolled specifications against recent low-priced commitments. Aside from flat-rolled specifications, which have shown a substantial increase in the past week, the volume of orders for other steel products was equally as great as in the previous week. For the time being at least, the downward trend in new steel bookings appears to have reached bottom, and slow expansion over the next several weeks is looked for. Most of this anticipated improvement will reflect incoming specifications and shipping data against earlier commitments.

Excluding from consideration sheets and strip, May bookings in the CHICAGO district were about on a par with those of April. The outlook for June is fairly good, and, though demand for flat-rolled will be practically nil throughout the month, activity in merchant wire products, reinforcing and merchant bars, and structural shapes may be expected to take up some of the slack. Orders are being received regularly for rolling of the low-priced tonnage taken three weeks ago but no new commitments to speak of are being made for these products at any price.

Summer sales prospects for makers of manufacturing wire, merchant bars and pig iron depend to a great degree on the 1940 model production schedule of the motor car plants.

Aggregate new business actually entered upon books of CLEVELAND and YOUNGSTOWN steel producers during May enabled the month to share top division honors with March as the heaviest of the year to date. In addition to the heavy coverage by sheet and strip consumers at low prices, gains over April volume were shown by such items as merchant bars, plates, semi-finished steel, and tubular goods. One surprise has been the contra-seasonal steadiness of rural demand for fence and nails. Tin plate orders are holding up well also. Products scheduled for bids in June indicate that structural tonnage in Ohio will be heavier than during May.

PIG IRON

... Prices likely to be unchanged ... Production gains

PRODUCTION has been stepped up the past week at PITTSBURGH, where several stacks banked during the coal tie-up have been put back in blast, and at BUFFALO, where half the district stacks are now melting, but in all principal areas there is irregular and small merchant demand, the production increase being among steel company furnaces.

It is expected that third quarter books will be opened shortly, probably at unchanged prices and with no formal announcements.

The Mystic furnace at Everett, Mass., will go into blast some time this week.

At CLEVELAND shipments in May held close to those of April, but the past 10 days have been quieter in orders. BUFFALO shipments are the best in several months and PITTSBURGH shipments are equal to those of a month ago.

BOSTON reports a continued quiet market with fewer shipping instructions against contracts placed many weeks ago, finds a slightly higher weekly melt and sees another stack blown in shortly while SOUTHERN

OHIO shows a slightly lighter melt, with machine tool foundries the most active and stove foundries tending toward seasonal improvement. St. Louis shipments during the last half of May declined sharply.

Spotty demand for prompt carlots features the NEW YORK market.

Export inquiries include 1000 tons from Sweden and a similar one from Holland, but little tonnage is being currently booked. There were fair size sales of Dutch-made iron in the NEW YORK area and in NEW ENGLAND.

Shipments of pig iron in CHICAGO in May were about 10 per cent better than the previous month while foundry coke showed an estimated 25 per cent improvement. A slight increase in general foundry melt in that territory has been noticed in the past two weeks.

STEEL OPERATIONS

... Ingot production rate advances four points to 52%

WITH larger backlog, particularly in sheets and strip, steel mills have advanced operating rates, the average for the industry this week being up four points to 52 per cent of capacity.

Sharp gains have occurred in the two principal districts, PITTSBURGH being up five points to 41 per cent and CHICAGO is up four and a half points to 53½ per cent. The WHEELING-WEIRTON district has gained nine points to 65 per cent, YOUNGSTOWN is six points higher at 49 per cent, SOUTHERN OHIO is 10 points higher at 53 per cent and BUFFALO is up five points to 46½ per cent. Among the major districts, the only loss is in CLEVELAND-LORAIN, which is down two points to 51 per cent, partly due to repairs at two open-hearth furnaces.

The Memorial Day holiday has had no effect on ingot output this week.

SHEETS AND STRIP

... "Bargain day" specifications heavier than expected

SPECIFICATIONS against orders placed at recent reduced prices are being received in some districts, such as PITTSBURGH and NEW YORK, in volume greater than anticipated, while at other points, such as CLEVELAND and

YOUNGSTOWN, specifications have been rather slow to materialize. New orders are light at most points. Finished sheet demand in SOUTHERN OHIO is holding at about 50 per cent.

At PITTSBURGH consumers in several instances are reported clamoring for shipments. This condition, however, is not indicative of the general situation. Mill order departments are busy getting in specifications and shipping data against commitments made two weeks ago. With price uncertainties out of the way and with coal operations restored to normal, consumers appear to have become more liberal in their steel requirements. Sheet and strip producers have set the end of the third quarter as a deadline for shipments on low-priced tonnage and considerable pressure is already being put on some customers, especially in cases involving orders taken for rolling at the mill's convenience. While no sharp upturn in sheet mill production is anticipated immediately, a slow but gradual improvement, reaching a climax in September, is anticipated.

Although bookings of sheets and strip by CHICAGO mills during May were far ahead of those of April, demand in the past week has been almost negligible. CHICAGO sellers look for little business in flat-rolled products until July at least. Oct. 1 appears to be the deadline for the shipment of low-priced tonnage. Wherever possible, however, mills will ship after June 30 at their own convenience.

STRUCTURAL STEEL

... Awards for bridges in South total 19,800 tons

THE leading award the past week was 11,000 tons for the Mississippi River bridge at Greenville, Miss., which went to American Bridge Co. Bethlehem Steel Co. will furnish 8800 tons of material for another Mississippi River bridge at Natchez, Miss., and 1500 tons involved in six barges the Bethlehem company will build for River Terminal Corp., New Orleans.

New business has tapered, the list including 2200 tons for a State library at Richmond, Va., 1800 tons for the Upper West Third Street Bridge at Cleveland, 1200 tons for the Plumb Beach Channel Bridge, Brooklyn, and 1000 tons for New York State highway work.

Specifications at PITTSBURGH have leveled off the past week, and May volume was slightly below that of

April. On the WEST COAST bridge awards accounted for 4600 tons of structural steel, included 2500 tons to the American Bridge Co. for two bridges on the Southern Pacific relocation around Shasta Dam, and 1500 tons for a new approach to the Ballard Bridge, Seattle, awarded to Isaacson Iron Works, Seattle.

PLATES

... Orders in May showed an improvement over April

F AIR-SIZED orders from various parts of the country enabled some of the plate mills in the Central districts to make a better showing in May than they made in April. Orders were principally from shipbuilders and Government work such as bridge cranes. A moderate amount of ship repair work is underway along the Great Lakes, including extensive overhauling of one boat by a CLEVELAND company. Alterations to a blast furnace in the CHICAGO district will require plates and a similar job is about to be announced in the Valleys district.

One of the larger boiler manufacturers in Ohio has recently received four orders totaling about \$1,000,000 each from public utilities, indicating that the log jam in this industry is being broken.

Prices on plates are still spotty in some localities, but weakness of one mill often is dictated by a desire to meet an advantage procured by another mill through the use of f. i. t. rates.

WAREHOUSE BUSINESS

... May sales about on a par with April's

CHICAGO steel warehouses report May sales on a par with those of April. A wide diversification of demand is still apparent and there has been no change in the general policy of hand-to-mouth buying. A better feeling has been reported in the past week or 10 days, and June is expected to hold fairly well to May levels. A seasonal dip is not looked for until some time in July.

Gains in warehouse business made in the early part of May in St. LOUIS were lost during the last 10 days of the month, due, it is believed to the uncertainty of the price situation as de-

veloped by the steel mills. Results in May will show a slight falling off as compared with April.

In line with action taken elsewhere, BOSTON warehouses have readjusted prices downward to conform with new prices recently issued by mills. The movement of material out of warehouses in May was a little more active than in April.

BUFFALO warehouses have also announced a new price schedule, most grades being down 15c. per 180 lb. Volume of business remains fairly good.

CINCINNATI warehouse business is not very good, but recent revision of prices is expected to result in the strengthening of the district market. Current business is largely industrial. Some improvement has followed the settlement of the coal strike. Construction items continue to be disappointing.

SHIPBUILDING

... Navy boats will take 9400 tons of steel

APPROXIMATELY 9400 tons of steel will be required for the eight submarines and the eight destroyers, to be divided equally between private builders and navy yards, on which bids were opened and the plan of allocation announced last Friday by the Navy Department. The vessels are provided for in the 1940 Naval Appropriation bill which was signed the previous day. Private builders were limited to two each of the destroyers, the low bidders being the Bath Iron Works, Bath, Me., and the Federal Shipbuilding & Dry Dock Co., Kearny, N. J. The Electric Boat Co., Groton, Conn., was the only bidder on the submarines.

The eight destroyers will call for about 4400 tons of steel, consisting of 3200 tons of plates, 1080 tons of shapes and 120 bars of bars. Requirements for the submarines will total about 5000 tons, consisting of 3720 tons of plates, 1200 tons of shapes and 80 tons of bars.

The Bath Iron Works, bidding on a fixed price basis, submitted a figure of \$5,627,000 for one destroyer and \$5,153,000 each for two. On a basis for adjustment of labor and material costs it bid \$5,277,000 for one ship and \$4,813,000 for each of two ships.

The Federal company put in a fixed price bid of \$5,850,000 for one destroyer and \$5,190,000 for each of two.

On an adjusted basis it bid \$5,520,000 for one and \$4,895,000 for each of two.

The Bethlehem Steel Corp. submitted bids on an adjusted basis only. For construction at its Fore River, Quincy, Mass., plant it submitted a bid of \$5,773,000 for one destroyer and \$5,368,000 for each of two. For its Union plant, San Francisco, it submitted a bid of \$6,355,000 for one and \$5,912,000 for each of two.

For an 800-ton submarine, the Electric Boat Co. put in a fixed bid of \$3,497,000 and an adjusted bid of \$2,797,000. For the three 1450-ton submarines, the company submitted fixed bids of \$4,657,000 for one, \$3,971,000 for each of two and \$3,671,000 for each of three vessels. Adjusted bids were \$3,727,000 for one, \$3,177,000 for each of two and \$2,937,000 for each of three ships.

WIRE PRODUCTS

... Demand is holding fairly steady... Automotive buying expected soon

ONE of the surprises at CLEVELAND has been the contra-seasonal steadiness of merchant wire product orders received by producers during the last part of May and enabling the month's total practically to equal that of April, which was ahead of March. January was the best month of this year to date by a large margin. Incoming business from the Central States and Kentucky indicate farmers are buying actively. Export shipments to South America continue brisk. Prices of merchant products remain spotty in a number of areas.

At PITTSBURGH manufacturers' wire and merchant wire product orders in May just about equaled April tonnages. Wire is expected to move a little faster within a few weeks owing to final clean-up orders from the automobile industry but on the whole no real improvement over the current levels of business at PITTSBURGH is expected in the near future.

Sales of merchant wire products in the Middle West have about reached the peak of the spring buying period. Since farmers are now in their fields it is expected that demand for fencing and other miscellaneous wire products will lessen during the summer months. Prospects for manufacturing wire are

good because of the 1940 automobile production season which is about to start. Chicago wire consumers for the most part are still buying for immediate needs only.

SEMI-FINISHED STEEL

... Orders are increasing, particularly in sheet bars

NEW business at PITTSBURGH registered another slight decline in the past week, although orders during May compared favorably with April volume. Specifications during June are expected to be stepped up substantially owing to demand from non-integrated sheet mills which participated in the recent heavy placement of flat rolled tonnages. Since much of this tonnage was taken on a basis that will actually bring less return than the price of sheet bars, some understanding on the price of the latter will probably have to be reached between steel producers and non-integrated mills.

At CLEVELAND during May forging billets showed a notable increase from the standpoint of incoming orders followed by sheet bars with a gain and re-rolling billets with a nominal increase. Sheet bar orders, however, are expected to continue to gain as non-integrated rolling mills for some time will be busy on sheet and strip tonnage recently placed.

REINFORCING BARS

... San Francisco post office to require 2850 tons

AWARDS declined about 25 per cent in volume the past week and new projects, headed by an increase of 2000 tons in original estimates for the Alameda, Cal., Navy barracks, were slightly lower.

The largest contract placed during the week was 2850 tons for the Rincon Hill post office at SAN FRANCISCO. Smaller awards on the WEST COAST totaled 1300 tons, while Bethlehem Steel Co. will provide 700 tons for an administrative building at Washington.

Department of Agriculture laboratories at CHICAGO and NEW ORLEANS will require 1050 tons of material, while inquiry in the NEW YORK territory is featured by approximately 1200 tons of mesh and bars for various New York State road projects, the first work of this size undertaken by the State this year. Specifications are reported holding up at PITTSBURGH.

RAILROAD BUYING

... Orders placed for 20 diesel electric locomotives

RECENT diesel-electric motive power orders booked by Electro-Motive Corp. include 14 switchers of 1000 hp. each for Great Northern, five 600-hp. switchers for Chicago, Burlington & Quincy, and one 600-hp. switcher for Pere Marquette.

Denver & Rio Grande Western has received court authorization to purchase 500 box cars, 50 gondola cars and 100 underframes from Pressed Steel Car Co. Ferrocarril al Pacifico, a Costa Rican railroad, has purchased 50 box cars from Magor Car Corp.

A Dow-Jones report that an important railroad may come into the market for several thousand freight cars may have emanated from banking circles, as freight car builders have received no such inquiry. If carloadings show a steady increase, and if the general business outlook becomes more promising, it is believed that some of the dormant inquiry, involving about 8000 cars, may be revived.

BOLTS, NUTS AND RIVETS

... Third quarter price decisions still being studied

BOLT, nut and rivet producers are still studying price possibilities for third quarter, considerable depending upon volume, which currently appears to show a slight upward tendency. Cap and set screw manufacturers report pressure has been noted in the East for a 10 per cent reduction, but books have not been opened for next quarter and no definite decisions arrived at.

MERCHANT BARS

... Pressure for price concessions is reported

CONSUMERS in many sections are reported to be exerting pressure for price concessions, following a sharp increase of bookings at some points during May because of coverage against the proposed \$1 per ton advance in connection with elimination of quantity allowances.

Several inquiries of 1500 tons and larger for third quarter shipment have appeared at CLEVELAND with some producers insisting that deliveries would have to be made at the mills' early convenience. Order books at PITTSBURGH continue to reflect a wide diver-

sification in new business with May orders no greater than those of April.

Bookings of bars in the CHICAGO area have increased somewhat, largely because of demand from forgers. Tractor makers still are active but no substantial increase in demand is expected until production of 1940 motor cars is definitely under way. Some sellers report that DETROIT labor trouble has already affected bars.

TIN PLATE

... Releases expected to be heavy during June

TIN plate specifications throughout the country have rolled in within the past few weeks at a sufficient rate to maintain operations this week unchanged at 70 per cent. Releases are expected to be heavy during June and there is a possibility that mills may reach 75 per cent operations before the end of the season. Demand is emanating from both general line can and sanitary can makers. With no change in quotations for third quarter shipments, releases from now on will be dictated entirely by the necessary requirements of can makers.

TUBULAR GOODS

... Low point in orders believed to have been passed

IN some cases tubular goods sales at PITTSBURGH in May were in slightly greater volume than in April, although the improvement did not amount to much from a tonnage standpoint.

At CLEVELAND and YOUNGSTOWN orders entered by tubular goods divisions during May showed an increase over April, due to line pipe tonnages. Merchant pipe and casing and tubing held practically even with the previous month from the standpoint of incoming business. Aggregate shipments registered a fair increase during May.

Although price irregularities in other steel items brought pressure upon tubular goods producers recently, quotations have been well maintained in the primary market.

Summer Upswing Not Likely, Buyers Told

HERE is only a slight possibility that business activity will turn toward this summer, Fred J. Heaslip, chairman of the business survey committee of the National Association of Purchasing Agents, told that organization at its recent convention in San Francisco.

Basic conditions in the United States are, however, sufficiently sound to justify an industrial upswing whenever businessmen shake off apprehension over foreign and domestic political developments, Mr. Heaslip said.

Industrial operators in this country most likely will find it necessary in the months to come to face a state of unrest abroad and a state of dissatisfaction with the administration of national affairs at home. Whether business likes it not, there is every likelihood that conditions within Government circles will continue substantially along present lines well toward the close of 1940, with the great possibility of an extension of similar conditions for another four years beyond that time.

"Consequently," Mr. Heaslip told the association, "in case there should be a definite clearing up of disturbances among the major nations of Europe, it would seem most essential that American industries find a way out of the quagmire into which they have thrown themselves, or are themselves thrown, through abject fear of further action of governing bodies. It would take a Solomon," he continued, "to discover how this can be done, but these commercial stampedes to points of safety leave only repercussions that result in bulging bank vaults and jobless men."

Labor Got 40½c. of 1938 Steel Dollar

LABOR'S share of the steel industry's sales dollar in 1938 was nearly 10 per cent greater than in 1937, and exceeded 1929 by 14 per cent, according to a recent study by the American Iron and Steel Institute.

Out of every dollar which the industry received last year from the sale of products, 40½c. went into the pay envelopes of employees. By comparison, 37c. of the steel dollar went into payrolls in 1937, and 35½c. in 1929.

Taxes represented another slice of the steel dollar which was greater in 1938 than in 1929. Steel taxes took 5½c. of each dollar received in 1938, almost 40 per cent more than in 1929 when less than 4c. of each steel dollar went for taxes.

The share of the steel dollar going for taxes in 1938 showed no decline from 1937, when the industry's total tax bill was the highest in history. The sharp reduction in income and profits taxes paid last year as a result of the year's unprofitable operations was largely offset by the increase in social security tax rates, with the result that in both years about 5½c. of each dollar went for taxes.

Accompanying the increases in the portions of the steel dollar going for payrolls and taxes, the shares going to stockholders and the additions to the industry's surplus were reduced to the vanishing point.

Last year about 7c. of each dollar received was charged off for depreciation and depletion, a share 40 per cent larger than the 5c. of each dollar which went to meet such charges in 1929 and 1937.

Interest charges on bonds amounted to 2c. per dollar of gross sales in 1938, as against one cent of the dollar in 1937 and 1½c. in 1929.

Weekly Bookings of Construction Steel

	Week Ended			Year to Date		
	May 29, 1939	May 23, 1939	May 2, 1938	June 1, 1938	1939	1938
Fabricated structural steel awards	35,215	12,850	11,950	6,525	437,675	278,700
Fabricated plate awards	1,610	2,020	17,470	3,010	72,005	55,315
Steel sheet piling awards	1,400	0	0	900	23,405	13,350
Reinforcing bar awards	7,400	10,400	19,250	2,050	207,195	95,460
Total Letting of Construction Steel	45,625	25,270	48,670	12,485	740,280	442,825

IRON AND STEEL SCRAP

... Buying is restricted, but market is stronger . . . Composite rises 13c. to \$14.21.

MAY 29—Based upon broker coverages at Chicago and Pittsburgh, the market averages on No. 1 steel are up 25c. and 12½c. respectively, although no important sales have been made into consumption. At Philadelphia, No. 1 is unchanged in price. THE IRON AGE composite has therefore moved up 13c., from \$14.08 (low point of 1939) to \$14.21. This is the first change in the Chicago price in six weeks, following a sharp drop of \$1. Cleveland prices are up 50c. on the principal grades, following recent mill purchases, and at Youngstown an increase of 25c. is a further reflection of moderate tonnages bought by Valley mills in the last fortnight. In two weeks, the total rise has been 75c. at both Ohio points. No. 1 steel is now quoted higher than the Pittsburgh price at both Youngstown and Philadelphia, buying for export being the chief factor at the latter point. In most other districts prices are nominally unchanged in the absence of test. Generally the feeling is better, however, because of the improved operating rate.

Pittsburgh

Although consumer interest continues lacking, the market undertone this week is stronger than a week ago. Supplies of regular No. 1 heavy melting steel are not plentiful and brokers are paying at least \$14.25 a ton in covering a recent \$14.50 sale into consumption. Based on an appraisal of market conditions, No. 1 heavy melting steel is up 12½c. a ton this week, being quotable at \$14.25 to \$14.50 a ton. The Pittsburgh district remains fairly well in a vacuum, with export business cleaning up scrap in the East and with higher prices being paid in the Youngstown district. As a matter of fact, brokers in the Youngstown district are paying more for No. 1 heavy melting steel than are Pittsburgh brokers.

Chicago

Although \$13 still marks the last mill purchase of heavy melting steel, improved open-hearth operations at Chicago district plants have created a situation whereby brokers are finding it impossible to buy steel for less than \$13. It is believed that the leading consumer will not be in the market for at least another week, but in view of the fact that the current broker buying price has increased, No. 1 steel this week is quoted at a flat \$13. It is doubtful if any brokers would sell today for less than \$13.50.

Youngstown

With open-hearth operations up sharply in this vicinity and orders more active, No. 1 heavy melting steel is quoted up 25c. per ton this week, to a range of \$14.75 to \$15.25. One mill tried unsuccessfully for several days last week to buy at around \$14.50 but dealers were unwilling to go along at that figure. Meanwhile at Warren where open-hearth operations are strong, shipments are going forward freely. The Pennsylvania list closing June 7 is heavy.

Cleveland

Open-hearth grades are quoted up 50c. per ton following the recent purchases by a local mill, partly reflected in quotations last week, which were up 25c. per ton. The market has been more active than seemed possible a month or six weeks ago. Open-hearth operations improved swiftly during the past two weeks. The New York Central list closing June 1 is moderate in size, as the road's shop operations were curtailed during the coal strike.

Buffalo

The market remains quiet this week and a strengthening note is apparent. Hopes are held that the improved ingot rate will lift scrap values. In the absence of sales, No. 1 heavy melting steel continues to be quoted at \$13 to \$13.50. Demand for cast scrap is down considerably.

St. Louis

The scrap market in St. Louis was quiet, following the heavy buying of the preceding week. Not much material is coming in, dealers say. No new deals are pending. Railroad malleable and brake shoes were off 25c. and 50c. a ton, respectively. Railroad lists: Pennsylvania, 20,000 tons; St. Louis Southwestern, 180 tons.

Cincinnati

Reported improved bookings among the district mills, particularly from automotive sources, has improved the general feeling of the old materials market here. No substantial basis however to this feeling is noticed and trading is still in very small lots with no substantial contracting reported. Dealers trading is at a low rate, but they are carefully watching the market in an effort to anticipate any upward trend. Prices are unchanged.

Detroit

Moving into June, iron and steel scrap in Detroit continues its sidewise price movement but there are some signs of a brightening of sentiment. With production at the lowest level of the year, scrap output is considerably below normal, thereby relieving a lot of the stress on buyers. In addition, releases have been

made recently against several old orders. This includes the first shipping of blast furnace scrap to the local consumer in six weeks. Prices paid on the most recent lists have justified the general opinion that the local market was riding the bottom, consequently there is growing hope that prices on June automotive lists will show some gains.

Boston

Material is being purchased and shipped to Italy, England, Holland and Japan, generally on a basis of \$14 a ton delivered dock for No. 1 steel. Loading is going on at Providence and Portland, Me., as well as here. Exports for May will run high into five figures. The domestic market is virtually at a standstill. A Weirton mill is in the market for bundled skeleton at \$7.15 a ton on cars shipping point, but obtaining little material.

Toronto

General unsettlement continues to feature the iron and steel scrap markets with consumptive demand restricted to special materials. The mills are taking schedule delivery on their short term contracts and there is fair movement of heavy melting steel. Reduced buying prices announced last week continue to hold and dealers state that large quantities of scrap are being delivered to yards. Some collectors are withholding scrap from the market for the present in the hope that buying prices again may be jacked up. Negotiations have been underway between some Toronto and Montreal dealers which may lead to shipment of fairly large tonnages of scrap from the latter center to Ontario consumers.

New York

The Japanese entered the market last week for their usual month-end commitments, but the tonnages involved were much smaller than usual. Prices on a few specialties were higher than before and closer to those obtained on recent European business. Buying prices are unchanged. Shipments were at a much higher rate the latter part of May and June shipments should bulk higher than any month thus far in 1939. Domestic shipments are at a low volume and prices for material on cars are nominally unchanged.

Philadelphia

Sentiment has stiffened here because of the advance in steel making operations. Prices, however, have so far showed no reaction, and brokers are willing to sell on the price list that has been in effect during the past two or three weeks. Domestic demands for scrap continue to be spotty and in comparatively poor volume. Foundry grades likewise show little activity, and specialties are almost inactive. The Budd Mfg. Co. June list of 2800 tons of compressed bundles is the smallest list that has been offered for some months, and the market is considerably interested in its disposition when bids are closed on Thursday. The export market of course continues to occupy the center of attention. Buying is as brisk as it ever has been. As previously mentioned, May deliveries from Port Richmond will exceed 30,000 tons, and from the number of boats now chartered it is safe to assume that June clearances will more than exceed this figure.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel.	\$14.25 to \$14.50
Railroad hvy. mltng.	15.00 to 15.50
No. 2 hvy. mltng. steel.	12.75 to 13.25
Scrap rails	15.50 to 16.00
Rails 3 ft. and under	17.00 to 17.50
Comp. sheet steel	14.25 to 14.50
Hand bundled sheets	13.25 to 13.50
Hvy. steel axle turn.	12.50 to 13.00
Machine shop turn	9.00 to 9.50
Short shov. turn	9.50 to 10.00
Mixed bor. & turn	6.50 to 7.00
Cast iron borings	6.50 to 7.00
Cast iron carwheels	14.50 to 15.00
Hvy. breakable cast	12.00 to 12.50
No. 1 cupola cast	15.00 to 15.50
RR. knuckles & cpcls.	16.50 to 17.00
Rail coil & leaf springs	17.00 to 17.50
Rolled steel wheels	17.00 to 17.50
Low phos. billet crops	18.00 to 18.50
Low phos. punchings	17.00 to 17.50
Low phos. plate	16.00 to 17.00

PHILADELPHIA

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel.	\$15.00 to \$15.50
No. 2 hvy. mltng. steel.	12.50 to 13.00
Hydraulic bund.	14.50 to 15.00
Hydraulic bund. old.	11.00 to 11.50
Steel rails for rolling	17.00 to 17.50
Cast iron carwheels	16.00
Hvy. breakable cast	14.50 to 15.00
No. 1 cast	16.00 to 16.50
Stove plate (steel wks.)	13.00
Railroad malleable	15.50 to 16.00
Machine shop turn	8.50 to 9.00
No. 1 blast furnace	6.50 to 7.00
Cast borings	6.50 to 7.00
Heavy axle turnings	10.00 to 10.50
No. 1 low phos. hvy.	17.00 to 17.50
Couplers & knuckles	17.00 to 17.50
Rolled steel wheels	17.00 to 17.50
Steel axles	20.00 to 20.50
Shafting	20.50 to 21.00
Spec. iron & steel pipe	12.00 to 12.50
No. 1 forge fire	12.00 to 12.50
Cast borings (chem.)	9.50 to 10.00

CHICAGO

Delivered to Chicago district consumers:	
Per Gross Ton	
Hvy. mltng. steel	\$13.00
Auto. hvy. mltng. steel	
alloy free	\$11.50 to 12.00
No. 2 auto steel	10.50 to 11.00
Shoveling steel	12.50 to 13.00
Factory bundles	12.00 to 12.50
Dealers' bundles	10.75 to 11.25
Drop forge flashings	9.25 to 9.75
No. 1 busheling	11.50 to 12.00
No. 2 busheling, old	5.25 to 5.75
Rolled carwheels	14.00 to 14.50
Railroad tires, cut	14.50 to 15.00
Railroad leaf springs	14.00 to 14.50
Steel coup. & knuckles	14.00 to 14.50
Axle turnings	12.00 to 12.50
Coil springs	15.50 to 16.00
Axle turn. (elec.)	13.00 to 13.50
Low phos. punchings	15.00 to 15.50
Low phos. plates 12 in. and under	14.50 to 15.00
Cast iron borings	6.50 to 7.00
Short shov. turn	6.50 to 7.00
Machine shop turn	6.00 to 6.50
Rerolling rails	17.50 to 18.00
Steel rails under 3 ft.	15.50 to 16.00
Steel rails under 2 ft.	16.00 to 16.50
Angle bars, steel	15.25 to 15.75
Cast iron carwheels	12.50 to 13.00
Railroad malleable	14.50 to 15.00
Agrie. malleable	10.75 to 11.25

Per Net Ton	
Iron car axles	\$18.00 to \$18.50
Steel car axles	17.50 to 18.00
Locomotive tires	13.00 to 13.50
Pipes and flues	8.50 to 9.00
No. 1 machinery cast	11.50 to 12.00
Clean auto. cast	12.50 to 13.00
No. 1 railroad cast	10.50 to 11.00
No. 1 agric. cast	10.00 to 10.50
Stove plate	7.25 to 7.75
Grate bars	7.75 to 8.25
Brake shoes	9.00 to 9.50

YOUNGSTOWN

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel.	\$14.75 to \$15.25
No. 2 hvy. mltng. steel.	13.75 to 14.25
Low phos. plate	15.75 to 16.25
Hydraulic bundles	14.25 to 14.75
Machine shop turn	8.25 to 8.75

CLEVELAND

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel.	\$13.75 to \$14.25
No. 2 hvy. mltng. steel.	12.75 to 13.25
Comp. sheet steel	13.25 to 13.75
Light bund. stampings	9.50 to 10.00
Drop forge flashings	11.00 to 11.50
Machine shop turn	7.00 to 7.50
Short shov. turn	7.50 to 8.00
No. 1 busheling	12.75 to 13.25
Steel axle turnings	10.50 to 11.00
Low phos. billet and bloom crops	17.50 to 18.00
Cast iron borings	7.25 to 7.75
Mixed bor. & turn	7.25 to 7.75
No. 2 busheling	7.50 to 8.00
No. 1 cupola cast	15.50 to 16.00
Railroad grate bars	8.50 to 9.00
Stove plate	9.00 to 9.50
Rails under 3 ft.	17.25 to 17.75
Rails for rolling	17.50 to 18.00
Railroad malleable	15.00 to 15.50
Cast iron carwheels	13.50 to 14.00

BUFFALO

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel.	\$13.00 to \$13.50
Railroad hvy. mltng.	13.50 to 14.00
No. 2 hvy. mltng. steel.	11.00 to 11.50
Scrap rails	13.50 to 14.00
New hvy. b'ndled sheets	11.00 to 11.50
Old hydraul. bundles	10.00 to 10.50
Drop forge flashings	11.00 to 11.50
No. 1 busheling	11.00 to 11.50
Machine shop turn	6.00 to 6.50
Knuckles & couplers	15.00 to 15.50
Coil & leaf springs	15.00 to 15.50
Rolled steel wheels	15.00 to 15.50
Shov. turnings	7.00 to 7.50
Mixed bor. & turn	7.00 to 7.50
Cast iron borings	7.00 to 7.50
No. 1 machinery cast	15.00 to 16.00
No. 1 cupola cast	14.50 to 15.00
Stove plate	13.00 to 13.50
Steel rails under 3 ft.	18.00 to 18.50
Cast iron carwheels	13.50 to 14.00
Railroad malleable	15.00 to 15.50

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:	
Selected hvy. melting	\$11.75 to \$12.25
No. 1 hvy. melting	11.50 to 12.00
No. 2 hvy. melting	10.50 to 11.00
No. 1 locomotive tires	12.25 to 12.75
Misc. stand. sec. rails	13.00 to 13.50
Railroad springs	14.00 to 14.50
Bundled sheets	7.00 to 7.50
No. 1 busheling	7.50 to 8.00
Cast. bor. & turn	2.50 to 3.00
Machine shop turn	3.50 to 4.00
Heavy turnings	9.00 to 9.50
Rails for rolling	16.00 to 16.50
Steel car axles	17.00 to 17.50
No. 1 RR. wrought	9.75 to 10.25
No. 2 RR. wrought	11.50 to 12.00
Steel rails under 3 ft.	16.00 to 16.50
Steel angle bars	13.00 to 13.50
Cast iron carwheels	14.00 to 14.50
No. 1 machinery cast	12.50 to 14.00
Railroad malleable	12.25 to 12.75
No. 1 railroad cast	12.00 to 12.50
Stove plate	7.50 to 8.00
Grate bars	8.50 to 9.00
Brake shoes	9.50 to 10.00

CINCINNATI

Dealers' buying prices per gross ton at yards:	
No. 1 hvy. mltng. steel.	\$10.50 to \$11.00
No. 2 hvy. mltng. steel.	8.25 to 8.75
Scrap rails for mltng.	14.00 to 14.50
Loose sheet clippings	6.00 to 6.50
Hydrau. b'ndled sheets	10.00 to 10.50
Cast iron boring	2.75 to 3.25
Machine shop turn	4.00 to 4.50
No. 1 busheling	6.75 to 7.25
No. 2 busheling	1.75 to 2.25
Rails for rolling	16.00 to 16.50
No. 1 locomotive tires	12.75 to 13.25
Short rails	16.75 to 17.25
Cast iron carwheels	12.00 to 12.50
No. 1 machinery cast	11.50 to 12.00
No. 1 railroad cast	11.50 to 12.00
Burnt cast	5.75 to 6.25
Stove plate	5.75 to 6.25
Agricul. malleable	10.25 to 10.75
Railroad malleable	12.75 to 13.25
Mixed hvy. cast	9.50 to 10.00

BIRMINGHAM

Per gross ton delivered to consumer:	
Hvy. melting steel	\$12.50 to \$14.00
Scrap steel rails	14.50 to 15.00
Short shov. turnings	7.50 to 8.10
Stove plate	9.00 to 10.00
Steel axles	15.00 to 16.00
Iron axles	15.00 to 16.00
No. 1 RR. wrought	10.00
Rails for rolling	16.00 to 16.50
No. 1 cast	14.50
Tramcar wheels	14.00

DETROIT

Dealers' buying prices per gross ton:	
No. 1 hvy. mltng. indus-	\$9.50 to \$10.00
No. 2 hvy. mltng. steel.	8.50 to 9.00
Borings and turnings	4.75 to 5.25
Long turnings	4.50 to 5.00
Short shov. turnings	5.00 to 5.50
No. 1 machinery cast	12.50 to 13.00
Automotive cast	13.00 to 13.50
Hvy. breakable cast	9.00 to 9.50
Stove plate	7.50 to 8.00
Hydrau. comp. sheets	10.50 to 11.00
New factory bushel	9.50 to 10.00
Sheet clippings	6.75 to 7.25
Flashings	9.00 to 9.50
Low phos. plate scrap	10.50 to 11.00

NEW YORK

Dealers' buying prices per gross ton on cars:	
No. 1 hvy. mltng. steel.	\$11.00 to \$11.50
No. 2 hvy. mltng. steel.	8.50 to 9.00
Hvy. breakable cast	10.50 to 11.00
No. 1 machinery cast	11.50 to 12.00
No. 2 cast	9.50 to 10.00

* \$1.50 less for truck loads.

† Northern N. J. prices are \$2 to \$2.50 higher

BOSTON

Dealers' buying prices per gross ton:	
Breakable cast	3.25
Machine shop turn	3.25
Mixed bor. & turn	2.00
Bun. skeleton long	7.15
Shafting	15.25 to 15.50
Cast bor. chemical	4.50 to 5.00
Per gross ton delivered consumers' yards:	
Textile cast	\$13.00 to \$14.00
No. 1 machine cast	13.00 to 14.00
Per gross ton delivered dealers' yards:	
No. 1 hvy. mltng. steel.	\$11.25 to \$11.50
No. 2 steel	10.00 to 10.25

PACIFIC COAST

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

Steel prices on these pages are base prices only and f.o.b. mill unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, deductions, and in most cases the amount of freight which must be absorbed in order to meet competition.

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (Rerolling only). Prices delivered Detroit are \$2 higher. F.o.b. Duluth, billets only, \$2 higher.

Per Gross Ton

Rerolling \$34.00
Forging quality 40.00

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton

Open hearth or bessemer \$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

Per Lb.

Grooved, universal and sheared 1.90c.

Wire Rods

(No. 5 to 9/32 in.)

Per Gross Ton

Pittsburgh, Chicago or Cleveland \$43.00
Worcester, Mass. 45.00
Birmingham 43.00
San Francisco 52.00
Rods over 9/32 in. or 47/64 in., inclusive, \$5 a ton over base.

SOFT STEEL BARS

Base per Lb.

Pittsburgh, Chicago, Gary, Cleveland, Buffalo and Birmingham 2.15c.
Detroit, delivered 2.25c.
Duluth 2.25c.
Philadelphia, delivered 2.47c.
New York 2.49c.
On cars dock Gulf ports 2.50c.
On cars dock Pacific ports 2.75c.

RAIL STEEL BARS

(For merchant trade)

Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown or Sparrows Pt. 2.00c.
On cars dock Tex. Gulf ports 2.45c.
On cars dock Pacific ports 2.70c.

BILLET STEEL REINFORCING BARS

(Straight lengths as quoted by distributors)

Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Cleveland, Youngstown or Sparrows Pt. 1.80c. to 2.05c.
Detroit, delivered 1.90c. to 2.15c.
On cars dock Tex. Gulf ports 2.15c. to 2.40c.
On cars dock Pacific ports 2.50c.

RAIL STEEL REINFORCING BARS

(Straight lengths as quoted by distributors)

Pittsburgh, Chicago, Gary, Buffalo, Cleveland, Youngstown or Birmingham 1.70c. to 1.90c.
Detroit, delivered 1.80c. to 2.00c.
On cars dock Tex. Gulf ports 2.05c. to 2.25c.
On cars dock Pacific ports 2.35c.

IRON BARS

Chicago and Terre Haute 2.15c.
Pittsburgh (refined) 3.60c.

COLD FINISHED BARS AND SHAFTING*

Base per Lb.

Pittsburgh, Buffalo, Cleveland, Chicago and Gary 2.65c.
Detroit 2.70c.

* In quantities of 10,000 to 19,999 lb.

PLATES

Base per Lb.

Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont, Del. 2.10c.*

Philadelphia, del'd 2.15c.
New York, del'd 2.19c. to 2.29c.
On cars dock Gulf ports 2.45c.
On cars dock Pacific ports 2.60c.
Wrought iron plates, P'tg 3.80c.

* Subject to concessions, particularly in the East, of \$2 a ton.

FLOOR PLATES

Pittsburgh or Chicago 3.35c.
New York, del'd 3.71c.
On cars dock Gulf ports 3.70c.
On cars dock Pacific ports 3.95c.

STRUCTURAL SHAPES

Base per Lb.

Pittsburgh, Chicago, Gary, Buffalo, Bethlehem or Birmingham 2.10c.
Philadelphia, del'd 2.215c.
New York, del'd 2.27c.
On cars dock Gulf ports 2.45c.
On cars dock Pacific ports 2.70c.

STEEL SHEET PILING

Base per Lb.

Pittsburgh, Chicago or Buffalo 2.40c.
On cars dock Gulf ports 2.85c.
On cars dock Pacific ports 2.90c.

RAILS AND TRACK SUPPLIES

Base per Lb.

Standard rails, heavier than 60 lb., per gross ton \$40.00
Angle bars, per 100 lb. 2.70

F.o.b. Basing Points

Light rails (from billets) per gross ton \$40.00
Light rails (from rail steel) per gross ton 39.00

Base per Lb.

Cut spikes 3.00c.
Screw spikes 4.55c.
Tie plates, steel 2.15c.
Tie plates, Pacific Coast ports. 2.25c.
Track bolts, to steam railroads 4.15c.
Track bolts to jobbers, all sizes (per 100 counts) 65-5

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS

Hot Rolled

Base per Lb.

Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown or Chicago 2.00c.
Detroit, delivered 2.10c.
Philadelphia, delivered 2.17c.
Granite City 2.10c.
On cars dock Pacific ports 2.50c.
Wrought iron, Pittsburgh 4.10c.

Cold Rolled*

Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown or Chicago 3.05c.
Detroit, delivered 3.15c.
Granite City 3.15c.
Philadelphia, delivered 3.37c.
On cars dock Pacific ports 3.65c.

* Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base.
From May 10 up to and including May 15, reductions from the base price of hot and cold rolled sheets running from \$4 to \$8 a ton were prevalent. Concessions withdrawn on May 15.

Galvanized Sheets, 24 Gage

Pittsburgh, Chicago, Gary, Sparrows Point, Buffalo, Middletown, Youngstown or Birmingham 3.50c.
Philadelphia, del'd 3.67c.
Granite City 3.60c.
On cars dock Pacific ports 4.00c.
Wrought iron Pittsburgh 6.10c.

Electrical Sheets (F.o.b. Pittsburgh)

Base per Lb.

Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
Motor	4.95c.
Dynamo	5.65c.
Transformer 72	6.15c.
Transformer 65	7.15c.
Transformer 58	7.65c.
Transformer 52	8.45c.

Silicon Strip in coils—Sheet price plus silicon sheet extra width extra plus 25c per 100 lb. for coils. Pacific ports add 70c. a 100 lb.

Long Ternes

No. 24 unassorted 8-lb. coating	3.80c.
f.o.b. Pittsburgh or Gary	4.50c.
F.o.b. cars dock Pacific ports	4.50c.

Vitreous Enameling Stock, 20 Gage*

Pittsburgh, Chicago, Gary, Youngstown, Middletown or Cleveland	3.35c.
Detroit, del'd	3.45c.
Granite City	3.45c.
On cars dock Pacific ports	3.95c.

TIN MILL PRODUCTS

*Tin Plate

Per Base Box

Standard cokes, Pittsburgh, Chicago and Gary	\$5.00
Standard cokes, Granite City	5.10

* Prices effective Nov. 10 on shipments through first quarter of 1939.

Special Coated Manufacturing Ternes

Per Base Box

Granite City	\$4.40
Pittsburgh or Gary	4.30

Roofing Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 112 sheets, 20 x 28 in.)	
8-lb. coating I.C.	\$12.00
15-lb. coating I.C.	14.00
20-lb. coating I.C.	15.00
25-lb. coating I.C.	16.00
30-lb. coating I.C.	17.25
40-lb. coating I.C.	19.50

Black Plate, 29 gage and lighter

Pittsburgh, Chicago and Gary	3.05c.
Granite City	3.15c.
On cars dock Pacific ports, boxed	3.80c.

HOT ROLLED STRIP

(Widths up to 12 in.)

Base per Lb.

Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown or Birmingham	2.00c.
Detroit, delivered	2.10c.

Cooperage Stock

Pittsburgh & Chicago	2.10c.
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From May 10 up to and including May 15, reductions in the base price of hot rolled strip running from \$4 to \$8 a ton were prevalent. Concessions withdrawn on May 15.

COLD ROLLED STRIP*

Base per Lb.

Pittsburgh, Youngstown or Cleveland	2.80c.
Chicago	2.90c.
Detroit, delivered	2.90c.
Worcester	3.00c.

* Carbon 0.25 and less.

Commodity Cold Rolled Strip

Pittsburgh, Youngstown, or Cleveland	2.95c.
Detroit, delivered	3.05c.
Worcester	3.35c.

From May 10 up to and including May 15, reductions from the base price of cold rolled strip amounting to \$4 a ton were prevalent. Concessions withdrawn on May 15.

COLD ROLLED SPRING STEEL

Pittsburgh and

Cleveland Worcester

Carbon	0.26-0.50%	2.80c.	3.00c.
Carbon	0.51-0.75	4.30c.	4.50c.
Carbon	0.76-1.00	6.15c.	6.35c.
Carbon	1.01-1.25	8.35c.	8.55c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh, Chicago, Cleveland and Birmingham)

To Manufacturing Trade

Per Lb.

Bright wire	2.60c.
Galvanized wire, base	2.65c.*
Spring wire	3.20c.

* On galvanizing wire to manufacturing trade, size and galvanizing extras are charged, the price Nos. 6 to 9 gage, inclusive, thus being 3.15c.

To the Trade

Base per Keg

Standard wire nails	\$2.45
Coated nails	2.45
Cut nails, carloads	3.60

Base per 100 Lb.

Annealed fence wire	\$2.95
Galvanized fence wire	3.35
Polished staples	3.15
Galvanized staples	3.40
Twisted barbless wire	3.30
Woven wire fence, base column	67
Single loop bale ties, base col.	56
Stand. 2 pt., 12.5 gage barbed cattle wire, per 80 rod spool	\$2.62
Stand. 2 pt., 12.5 gage barbed hog wire, per 80 rod spool	\$2.80

Note: Birmingham base same on above items, except spring wire.

Add \$4 a ton for Mobile, Ala.; \$5 for New Orleans; \$6 for Lake Charles to above bases, except on galvanized and annealed merchant fence wire, which are \$1 a ton additional in each case.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills. F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

	Steel	Wrought Iron
In.	Black Galv.	Black Galv.
5/8	36	1/4 & 5/8 +9 +30
1/2 to 5/8	43 1/2	1/2 ... 24 6 1/2
1/2	54	3/4 ... 30 13
5/8	58	1 & 1 1/4 34 19
1 to 3	68 1/2 60 1/2	1 1/2 ... 38 21 1/2
2	72	2 ... 37 1/2 21

Lap Weld

	2	2 1/2 & 3	3 1/2	4 1/2	5 1/2	7	9 & 10	11 & 12
	61	52 1/2	55 1/2	57 1/2	55 1/2	66 1/2	64 1/2	63 1/2
1/2	36	1/4 & 5/8 +9 +30	2 1/2 to 3 1/2	31 1/2 17 1/2	4 1/2 to 8 32 1/2	20	9 to 12 28 1/2	15
1/2	43 1/2	2 1/2 to 3 1/2	33 1/2 21	4 1/2 to 8 32 1/2	20	6 1/2 to 6 37 1/2	24	12 63 1/2 54
1/2	54	3/4 ... 30 13	4 1/2 to 8 32 1/2	20	7 & 8 36 1/2 24	7 & 8 38 1/2 24 1/2	9 to 12 32 1/2	20 1/2
1/2	60 1/2	1 & 1 1/4 34 19	1 to 2 ... 38 22 1/2	1 to 2 ... 38 22 1/2	55	9 to 12 28 1/2	15	10 64 1/2 55
1/2	63 1/2	21 1/2	2	2 ... 30 1/2 15	60	1 to 2 ... 38 22 1/2	15	12 63 1/2 54

Lap weld, extra strong, plain ends

	2	2 1/2 & 3	3 1/2	4 1/2	5 1/2	7	9 & 10	11 & 12
	59	51 1/2	55 1/2	57 1/2	55 1/2	66 1/2	64 1/2	63 1/2
1/2	51 1/2	2 ... 33 1/2 18 1/2	2 1/2 to 4 39 1/2 25 1/2	4 1/2 to 6 37 1/2 24	4 1/2 to 8 32 1/2 20	7 & 8 36 1/2 24	9 to 12 32 1/2 20 1/2	11 & 12 63 1/2 54
1/2	55	1/4 & 5/8 +10 +43	2 1/2 to 4 39 1/2 25 1/2	4 1/2 to 6 37 1/2 24	4 1/2 to 8 32 1/2 20	7 & 8 38 1/2 24 1/2	9 to 12 32 1/2 20 1/2	11 & 12 63 1/2 54
1/2	60	1/4 & 5/8 +10 +43	2 ... 33 1/2 18 1/2	2 1/2 to 4 39 1/2 25 1/2	4 1/2 to 6 37 1/2 24	7 & 8 38 1/2 24 1/2	9 to 12 32 1/2 20 1/2	11 & 12 63 1/2 54

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base rate.

F.o.b. Gary prices are two points lower discount or \$4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or \$2 a ton higher, on all butt weld 8 in. and smaller.

Boiler Tubes

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes. Minimum Wall. (Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

Lap

	Seamless	Lap
	Cold	Hot
1 in. o.d.	13 B.W.G.	\$ 9.01
1 1/2 in. o.d.	13 B.W.G.	10.67
1 1/2 in. o.d.	13 B.W.G.	11.70
1 1/2 in. o.d.	13 B.W.G.	10.23
1 1/2 in. o.d.	13 B.W.G.	\$9.72
1 1/2 in. o.d.	13 B.W.G.	11.64
1 1/2 in. o.d.	13 B.W.G.	11.06
2 in. o.d.	13 B.W.G.	13.42
2 in. o.d.	13 B.W.G.	13.03
2 1/2 in. o.d.	13 B.W.G.	16.76
2 1/2 in. o.d.	13 B.W.G.	14.54
2 1/2 in. o.d.	13 B.W.G.	13.79
2 1/2 in. o.d.	13 B.W.G.	16.01
2 1/2 in. o.d.	13 B.W.G.	16.58
2 1/2 in. o.d.	13 B.W.G.	20.21
2 1/2 in. o.d.	13 B.W.G.	17.54
3 in. o.d.	12 B.W.G.	21.42
3 in. o.d.	12 B.W.G.	18.59
3 in. o.d.	12 B.W.G.	17.54
3 1/2 in. o.d.	12 B.W.G.	22.48
3 1/2 in. o.d.	12 B.W.G.	19.50
3 1/2 in. o.d.	12 B.W.G.	18.35
4 in. o.d.	11 B.W.G.	28.37
4 in. o.d.	11 B.W.G.	24.62
4 in. o.d.	11 B.W.G.	23.15
4 in. o.d.	10 B.W.G.	35.20
4 in. o.d.	10 B.W.G.	30.54
4 in. o.d.	10 B.W.G.	28.68
5 in. o.d.	10 B.W.G.	43.04
5 in. o.d.	10 B.W.G.	37.35
5 in. o.d.	9 B.W.G.	54.01
5 in. o.d.	9 B.W.G.	46.87
5 in. o.d.	9 B.W.G.	44.25
4 in. o.d.	7 B.W.G.	82.93
4 in. o.d.	7 B.W.G.	71.96
4 in. o.d.	7 B.W.G.	68.14

Extra for less carload quantities:

10,000 lb. or ft. over Base

30,000 lb. or ft. to 39,999 lb. or ft. 5%

20,000 lb. or ft. to 29,999 lb. or ft. 10%

10,000 lb. or ft. to 19,999 lb. or ft. 20%

5,000 lb. or ft. to 9,999 lb. or ft. 30%

2,000 lb. or ft. to 4,999 lb. or ft. 45%

Under 2,000 lb. or ft. 65%

CAST IRON WATER PIPE

Per Net Ton

*6-in. and larger, del'd Chicago	\$51.00
6-in. and larger, del'd New York	49.00
6-in. and larger, Birmingham	43.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	52.00
F.o.b. dock, Seattle	52.00
or Los Angeles	55.00
F.o.b. dock, Seattle	52.00

Class "A" and gas pipe, \$3 extra
4-in. pipe is \$3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is \$42, Birmingham, and \$50 delivered Chicago and 4-in. pipe, \$45. Birmingham, and \$54 delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine and carriage bolts:	
1/4 in. & 6 in. and smaller	68 1/2
Larger and longer up to 1 in.	66
1/4 in. and larger	64
Lag bolts	66
Plow bolts, Nos. 1, 2, 3	68 1/2
and 7	68 1/2

Hot pressed nuts, and c.p.c. and t-nuts, square or hex. blank or tapped:

1/4 in. and smaller	67
9/16 in. to 1 in. inclusive	64
1 1/8 in. and larger	62

On the above items with the exception of plow bolts, there is an additional allowance of 10 per cent for full container quantities.

On all of the above items, there is an additional 5 per cent allowance for carload shipments.

Semi-fin. hexagon nuts U.S.S. S.A.E. 1/4 in. and smaller ... 67 70

1/16 in. to 1 in. ... 64 65

1 1/8 in. and larger ... 62 62

In full container lots, 10 per cent additional discount.

Stove bolts in packages, nuts attached

Stove bolts in packages, with nuts separate

Stove bolts in bulk

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(1/4 in. and larger)

Base Per 100 Lb.

(F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham) ... \$3.40

Per Cent Off List

(F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham) ... 65 and 10

Small Rivets

(7/16 in. and smaller)

Per Cent Off List

(F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham) ... 65 and 10

Cap and Set Screws

(Freight allowed to destination)

Per Cent Off List

Milled hexagon head, cap screws, 1 in. dia. and smaller ... 50 and 10

Milled headless set screws, cut thread 1/4 in. and smaller ... 70

Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller ... 67 1/2

Upset set screws, cup and oval points

Milled studs

Sheet Bars

Alloy

S.A.E. Series

Differential Numbers

per 100 Lb.

200 (1 1/2% Nickel) ... \$0.35

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

Open-hearth grade, base

2.70c. Delivered, Detroit

2.80c.

S.A.E. Alloy

Series Differential

Numbers per 100 Lb.

200 (1 1/2% Nickel) ... \$0.35

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.

Base price, \$56.00 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

Open-hearth grade, base

2.70c. Delivered, Detroit

2.80c.

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	\$22.00
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	22.00
Delivered Brooklyn	24.50
Delivered Newark or Jersey City	23.53
Delivered Philadelphia	22.84
F.o.b. Neville Island, Erie, Pa., Toledo, Chicago, Granite City, Cleveland and Youngstown	21.00
F.o.b. Buffalo	21.00
F.o.b. Detroit	21.00
Southern, delivered Cincinnati	21.06
Northern, delivered Cincinnati	21.44
F.o.b. Duluth	21.50
F.o.b. Provo, Utah	19.00
Delivered, San Francisco, Los Angeles or Seattle	24.50
F.o.b. Birmingham*	17.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 0.70 per cent and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same, except at Birmingham and Provo, which are not malleable iron basing points.

Basic

F.o.b. Everett, Mass.	\$21.50
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	21.50
F.o.b. Buffalo	20.00
F.o.b. Neville Island, Erie, Pa., Toledo, Chicago, Granite City, Cleveland and Youngstown	20.50
Delivered Philadelphia	22.34
Delivered Canton, Ohio	21.89
Delivered Mansfield, Ohio	22.44
F.o.b. Birmingham	16.00

Bessemer

F.o.b. Buffalo	\$22.00
F.o.b. Everett, Mass.	23.00
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	23.00
Delivered Newark or Jersey City	24.53
Erie, Pa., and Duluth	22.00
F.o.b. Neville Island, Toledo, Chicago and Youngstown	21.50
F.o.b. Birmingham	22.00
Delivered Cincinnati	22.11
Delivered Canton, Ohio	22.89
Delivered Mansfield, Ohio	23.44

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y. 26.50

Gray Forge

Valley or Pittsburgh furnace. \$20.50

Charcoal

Lake Superior furnace \$25.00
Delivered Chicago 28.34

Canadian Pig Iron

Per Gross Ton

Montreal

Foundry Iron	\$24.50 base
Malleable	25.00 base
Basic	24.50 base

Toronto

Foundry iron	\$22.50 base
Malleable	23.00 base
Basic	22.50 base

On all grades 2.25 per cent silicon and under is base. For each 25 points of silicon over 2.25 per cent an extra of 25c. is charged.

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload) \$80.00

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21% \$28.00

Domestic, 26 to 28% 33.00

Electric Ferrosilicon

Per Gross Ton Delivered; Lump Size

50% (carload lots, bulk) \$69.50*

50% (ton lots in 50 gal. bbl.) 80.50*

75% (carload lots, bulk) 126.00*

75% (ton lots in 50 gal. bbl.) 139.00*

Bessemer Ferrosilicon

F.o.b. Furnace, Jackson, Ohio Per Gross Ton

10.00 to 10.50% \$30.50

For each additional 0.50% silicon up to 12%, 50c. per ton is added. Above 12% add 75c. per ton.

For each unit of manganese over 2%, \$1 per ton additional. Phosphorus 0.75% or over, \$1 per ton additional.

Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 5.00 to 5.50% \$24.50

For each additional 0.5% silicon up to 12%, 50c. a ton is added. Above 12% add 75c. a ton.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed.

Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Ferrochrome

Per Lb. Contained Cr., Delivered Carlots, Lump Size, on Contract

4 to 6% carbon 10.50c.*

2% carbon 16.50c.*

1% carbon 17.50c.*

0.10% carbon 19.50c.*

0.06% carbon 20.00c.*

Silico-Manganese

Per Gross Ton, Delivered, Lump Size, Bulk, on Contract

3% carbon \$83.00

2.50% carbon 88.00

2% carbon 93.00

1% carbon 103.00

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads. \$1.75

Ferrotungsten, 100 lbs. and less 2.00

Ferrovanadium, contract, per lb. contained V, delivered \$2.70 to \$2.90†

Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., tons lots \$2.25†

Ferrocobaltititanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton \$142.50

Ferrocobaltititanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton \$157.50

Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unit-age, freight equalized with Rockdale, Tenn., per gross ton \$58.50

Ferrophosphorus, electrolytic, 23-26% in car lots, f.o.b. Monsanto (Siglo), Tenn., 24%, per gross ton, \$3 unit-age, freight equalized with Nashville \$75.00

Ferromolybdenum, per lb. Mo. f.o.b. furnace 95c.

Calcium molybdate, per lb. Mo. f.o.b. furnace 80c.

Molybdenum oxide briquettes 48-52% Mo; per lb. contained Mo, f.o.b. Langloch, Pa. 80c.

* Spot prices are \$5 per ton higher.

† Spot prices are 10c. per lb. of contained element higher.

ORES

Lake Superior Ores

Delivered Lower Lake Ports Per Gross Ton

Old range, Bessemer, 51.50% \$5.25

Old range, non-Bessemer, 51.50% 5.10

Messabi, Bessemer, 51.50% 5.10

Messabi, non-Bessemer, 51.50% 4.95

High phosphorus, 51.50% 4.85

Foreign Ore

C.i.f. Philadelphia or Baltimore Per Unit

Iron, low phos., copper free, 55 to 58% dry, Algeria 12c

Iron, low phos., Swedish, average, 68½% iron 12c

Iron, basic or foundry, Swedish, average, 65% iron 11c

Iron, basic or foundry, Russian, average, 65% iron Nominal

Man., Caucasian, washed 52% 29c

Man., African, Indian, 44-48% 28c

Man., African, Indian, 49-51% 28c

Man., Brazilian, 46 to 48% 27c

Per Short Ton Unit

Tungsten, Chinese, Wolframite, duty paid, delivered \$18.50

Tungsten, domestic, scheelite delivered \$15.00 to \$17.00

Chrome or (lump) c.i.f. Atlantic Seaboard, per gross ton:

50% \$24.00

48-49% 23.50

FLUORSPAR

Per Net Ton

Domestic washed gravel, 85-86% f.o.b. Kentucky and Illinois mines, all rail \$18.00

Domestic, f.o.b. Ohio River landing barges 19.00

No. 2 lump, 85-5, f.o.b. Kentucky and Ill. mines 19.00

Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid 21.50

Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines 31.50

COKE

Per Net Ton

Furnace, f.o.b. Connellsville, Prompt \$3.75

Furnace, f.o.b. Connellsville, Prompt \$4.75 to 5.50

Foundry, by - product, Chicago ovens 10.25

Foundry, by - product, del'd New England 12.50

Foundry, by - product, del'd Newark or Jersey City 10.88 to 11.40

Foundry, by - product, Philadelphia 10.95

Foundry, by - product, delivered Cleveland 10.30

Foundry, by - product, delivered Cincinnati 9.75

Foundry, Birmingham 7.50

Foundry, by - product, del'd St. Louis industrial district 10.75 to 11.00

Foundry, from Birmingham, f.o.b. cars dock Pacific ports 14.75

IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH*

Base per Lb.

Plates	3.40c.
Shapes	3.40c.
Soft steel bars and small shapes	3.35c.
Reinforcing steel bars	2.70c.
Cold finished bars and screw stock	3.65c.
Hot rolled strip	3.60c.
Hot rolled sheets	3.35c.
Galv. sheets (24 ga.) 500 lb. to 1499 lb.	4.50c.
Wire, black, soft annealed	3.15c.
Wire, galv., soft	3.55c.
Track spikes (1 to 24 kegs)	3.60c.
Wire nails (in 100-lb kegs)	2.65c.

On plates, structural, bars, strip and hot rolled sheets, base applied to orders of 400 to 1999 lb. On reinforcing bars base applies to orders of less than one ton and includes switching and earing charge.

All above prices for delivery within the Pittsburgh switching district.

NEW YORK

Base per Lb.

Plates, $\frac{1}{4}$ in. and heavier	3.76c.
Structural shapes	3.75c.
Soft steel bars, round	3.84c.
Iron bars, Swed. char-coal	7.50 to 8.25c.
Cold-fin. shafting and screw stock:	
Rounds, squares, hexagons	4.09c.
Flats up to 12 in. wide	4.09c.
Cold-rolled strip, soft and quarter hard	3.51c.
Hot-rolled strip, soft O.H.	3.96c.
*Hot-rolled sheets (8-30 ga.)	3.40c.
Galv. sheets (24 ga.)	4.50c.
Long ternes (24 ga.)	5.50 to 6.20c.
Cold-rolled sheets (20 ga.)	
Standard quality	4.60c.
Deep drawing	4.85c.
Stretcher leveled	5.10c.
SAE 2300, hot-rolled	7.35c.
SAE 3100, hot-rolled	5.90c.
SAE 6100, hot-rolled annealed	8.75c.
SAE 2300, cold-rolled	8.59c.
SAE 3100, cold-rolled, annealed	8.19c.
Floor plate, $\frac{1}{4}$ in. and heavier	5.43c.
Standard tool steel	12.50c.
Wire, black, annealed (No. 9)	4.65c.
Wire, galv. (No. 9)	5.00c.
Open-hearth spring steel	4.75c. to 10.25c.
Common wire nails, per keg in 25 keg lots	\$2.90

*For lots less than 2000 lb.

CHICAGO

Base per Lb.

Plates and structural shapes	3.55c.
Soft steel bars, rounds and angles	3.50c.
Soft steel squares, hexagons, channels and Tees	3.65c.
Hot rolled strip	3.60c.
Floor plates	5.15c.
Hot rolled sheets	3.35c.
Galvanized sheets	4.25c.
Cold rolled sheets	4.30c.
Cold finished carbon bars	3.75c.

Above prices are subject to deductions and extras for quantity and are f.o.b. consumer's plant within Chicago free delivery zone.

CLEVELAND

Base per Lb.

Plates	3.40c.
Structural shapes	3.58c.
Soft steel bars	3.25c.
Reinfor. bars (under 2000 lb.) [†]	2.55c.
Cold-fin. bars (1000 lb. over)	3.75c.
Hot-rolled strip	3.50c.
Cold rolled sheets	4.55c.
Cold finished strip	3.20c.
Galvanized sheets (No. 24)	4.62c.
Hot-rolled sheets	3.35c.
Floor plates, $\frac{3}{16}$ in. and heavier	5.18c.
*Black ann'd wire, per 100 lb.	\$3.10
*No. 9 galv. wire, per 100 lb.	3.50
Common wire nails, base per keg	2.60
Hot rolled alloy steel (3100)	5.85c.
Cold rolled alloy steel (3115)	6.75c.

* For 5000 lb. or less.

[†] 500 lb. base quantity.

Prices shown on hot rolled bars, strip, sheets, shape and plates are for 400 to 1999 lb. Alloy steel, 1000 lb. and over; galvanized sheets, 150 to 1499 lb.; cold rolled sheets, 399 lb. and under.

ST. LOUIS

Base per Lb.

Plates and structural shapes	3.47c.
Bars, soft steel (rounds and flats)	3.62c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	3.77c.
Cold fin. rounds, shafting, screw stock	4.02c.
Galv. sheets (24 ga.)	4.53c.
Hot rolled sheets	3.38c.
Galv. corrugated sheets, 24 ga. and heavier*	4.58c.
Structural rivets	5.02c.

* No. 26 and lighter take special prices.

BOSTON

Base per Lb.

Structural shapes, 3 in. and larger	3.85c.
Plates, $\frac{1}{4}$ in. and heavier	3.85c.
Bars	3.88c.
Heavy hot rolled sheets	3.71c.
Hot rolled sheets	4.21c.
Hot rolled annealed sheets	4.61c.
Galvanized sheets	4.61c.
Cold rolled sheets	4.71c.

The following quantity differentials apply: Less than 100 lb., plus \$1.50 per 100 lb.; 100 to 399 lb., plus 50c.; 400 to 1999 lb. base; 2000 to 9999 lb., minus 20c.; 10,000 to 39,999 lb., minus 30c.; 40,000 lb. and over minus 40c.

BUFFALO

Base per Lb.

Plates	3.62c.
Floor plates	5.25c.
Struc. shapes	3.40c.
Soft steel bars	3.35c.
Reinforcing bars (20,000 lb. or more)	2.05c.
Cold-fin. flats, squares, rounds, and hex.	3.65c.
Hot-rolled sheets, $\frac{3}{16}$ x 14 in. to 48 in. wide incl. also sizes	
No. 8 to 30 ga.	3.35c.
Galv. sheets (24 ga.)	4.50c.
Band and hoops	3.82c.

NEW ORLEANS

Base per Lb.

Mild steel bars	4.20c.
Reinforcing bars	3.24c.
Structural shapes	4.10c.
Plates	4.10c.
Hot-rolled sheets, No. 10	4.35c.
Steel bands	4.75c.
Cold-finished steel bars	5.10c.
Structural rivets	4.85c.
Boiler rivets	4.85c.
Common wire nails, base per keg	3.55
Bolts and nuts, per cent off list	60

REFRACTORIES PRICES

Fire Clay Brick

Per 1000 f.o.b. Works

Super-duty brick, at St. Louis	\$60.90
Maryland, Kentucky, Missouri and Illinois	47.50
First quality, New Jersey	52.50
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	42.75
Second quality, New Jersey	49.00
No. 1, Ohio	39.90
Ground fire clay, per ton	7.10

Silica Brick

Per 1000 f.o.b. Works

Pennsylvania	\$47.50
Chicago District	55.10
Birmingham	47.50
Silica cement per net ton (Eastern)	8.55

Chrome Brick

Net per Ton

Standard f.o.b. Baltimore, Plymouth Meeting and Chester	\$47.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	47.00
Magnesite Brick	

Net per Ton

Standard f.o.b. Baltimore and Chester	\$67.00
Chemically bonded f.o.b. Baltimore	57.00

Grain Magnesite

Net per Ton

Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	\$45.00
Domestic, f.o.b. Baltimore and Chester in sacks	40.00
Domestic, f.o.b. Chewelah, Wash. (in bulk)	22.00

PHILADELPHIA

Base per Lb.

Plates, $\frac{1}{4}$ -in. and heavier	3.40c.
Structural shapes	3.40c.
Soft steel bars, small shapes, iron bars (except bands)	3.60c.
Reinforced steel bars, square and deformed	2.61c.
Cold-finished steel bars	4.11c.
Steel hoops	4.10c.
Steel bands, No. 12 and 3/16 in. incl.	3.60c.
Spring steel	4.75c.
Hot-rolled annealed sheets	3.40c.
Galvanized sheets (No. 24)	4.43c.
Diam. pat. floor plates, $\frac{1}{4}$ in.	5.00c.

These prices are for delivery in Philadelphia trucking area.

*For quantities between 400 and 1999 lb.

†For 10 bundles or over.

‡For one to five tons.

BIRMINGHAM

Base per Lb.

Bars and bar shapes	3.50c.
Structural shapes and plates	3.45c.
Hot rolled sheets No. 10 ga.	3.40c.
Galvanized sheets No. 24 ga.	4.75c.
or more	
Strip	3.65c.
Reinforcing bars	3.50c.
Floor plates	5.83c.
Cold finished bars	4.73c.
Machine and carriage bolts	50 & 10 off list
Rivets (structural)	5.00c.

On plates, shapes, bars, hot-rolled strip heavy hot-rolled sheets, the base applies on 400 to 3999 lb. All prices are f.o.b. consumer's plant.

PACIFIC COAST

Base per Lb.

San Francisco	3.60c.
Los Angeles	3.40c.
Seattle	3.65c.

Plates, tanks and U. M.	3.60c.
Shapes, standard	3.60c.
Soft steel bars	3.55c.
Reinforcing bars, f.o.b. cars dock	
Pacific ports	2.275c. open. 2.975c.
Hot-rolled sheets (No. 10)	3.45c. 4.05c. 3.80c.
Galv. sheets (No. 24 and lighter)	5.15c. 4.75c. 4.75c.
Galv. sheets (No. 22 and heavier)	5.40c. 4.75c. 4.75c.
Cold-finished steel	
Rounds	6.55c. 6.60c. 7.10c.
Squares and hexagons	7.80c. 7.85c. 7.10c.
Flats	8.30c. 8.35c. 8.10c.
Common wire nails—base per keg less carload	\$3.00 \$2.85 \$3.00

All items subject to differentials for quantity.

ST. PAUL

Base per Lb.

Mild steel bars, rounds	4.10c.

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FABRICATED STEEL

... Lettings jump to 35,225 tons from 12,850 tons a week ago . . . New projects decline to 16,425 tons from 20,300 tons last week . . . Plate awards call for 1610 tons.

NORTH ATLANTIC STATES AWARDS

2500 Tons, Jersey City, N. J., Nurses' Home, Medical Center, to Lehigh Structural Steel Co., Allentown, Pa.
 725 Tons, Huguenot, Staten Island, grade crossing elimination, Staten Island Railroad Co., to Bethlehem Steel Co., Bethlehem, Pa.
 600 Tons, New York, Madison Square Boys' Club building, to Harris Structural Steel Co., Plainfield, N. J.
 515 Tons, New York, Harlem Boys' Club, Children's Aid Society, to Harris Structural Steel Co., Plainfield, N. J.
 500 Tons, Pittsburgh, Mission Street bridge, to Bethlehem Steel Co., Bethlehem, Pa.
 480 Tons, Washington, Civil Aeronautical Authority, galvanized towers and extensions, to American Bridge Co., Pittsburgh.
 475 Tons, Middletown, N. Y., high school to American Bridge Co., Pittsburgh.
 465 Tons, Danielson, Conn., manufacturing building, V. LaRosa & Sons, Inc., to Lehigh Structural Steel Co., Allentown, Pa.
 300 Tons, Eden, N. Y., school, to Ernst Iron Works, Buffalo.
 235 Tons, New Brighton, S. L., addition to United States Gypsum Co. building, to Fort Pitt Bridge Works Co., Pittsburgh.
 175 Tons, Syracuse, N. Y., factory building, Kilian Mfg. Co., to Syracuse Engineering Co., Syracuse, N. Y.
 175 Tons, Somerset, Pa., Laurel Hill tunnel, Pennsylvania Turnpike Commission, to Republic Steel Co., Cleveland.
 160 Tons, Rockland, Del., du Pont residence, to Bethlehem Fabricators, Inc., Bethlehem, Pa.
 160 Tons, Wilmington, Del., S. S. Kresge Co. store, to Belmont Iron Works, Philadelphia.
 130 Tons, Cumberland, Md., building, McCrory Stores Corp., to Levinson Steel Co., Pittsburgh.
 125 Tons, Orono, Me., resident hall for women, University of Maine, to Lyons Iron Works, Manchester, N. H.
 100 Tons, Huntington, Vt., bridge, to American Bridge Co., Pittsburgh.

THE SOUTH

11,000 Tons, Greenville, Miss., superstructure for Mississippi River bridge, to American Bridge Co.
 9000 Tons, Natchez, Miss., Mississippi River bridge superstructure to Bethlehem Steel Co., Bethlehem, Pa.
 555 Tons, Caddo Parish, La., bridge 1806, to Jones & Laughlin Steel Corp., Pittsburgh.
 205 Tons, Ellis County, Tex., bridge FAGM-487-B, to Virginia Bridge Co., Roanoke, Va.

CENTRAL STATES

560 Tons, Hutsonville, Ill., boiler house, Central Illinois Public Service Corp., to Mississippi Valley Structural Steel Co., St. Louis.
 275 Tons, Brington, Ohio, C & O Railway Co., deck plate girder viaduct, to American Bridge Co., Pittsburgh.
 250 Tons, Eureka, Wis., Fox River bridge, to Wisconsin Bridge & Iron Works, Milwaukee.
 205 Tons, Portage County, Wis., bridge FAGM 236, to Milwaukee Bridge Co., Milwaukee.
 180 Tons, Decatur, Ill., Archer-Daniels Midland building, to Mississippi Valley Structural Steel Co., St. Louis.
 165 Tons, Gettysburg and Laplant, S. D., beam bridges for Department of Interior, to Bethlehem Steel Co., Bethlehem, Pa.
 150 Tons, Worthington, Minn., power plant addition, to Minneapolis-Moline Power Implement Co., Minneapolis.
 105 Tons, Minneapolis, railroad bridge, transfer table, to Wisconsin Bridge & Iron Co., Milwaukee.

WESTERN STATES

1650 Tons, Pollock, Calif., Sacramento River second crossing, to American Bridge Co., Pittsburgh.
 1508 Tons, Seattle, Ballard bridge approach (Alternative B), to Isaacson Iron Works, Seattle; through Acme Construction Co., West Coast Construction Co. and Macri Brothers, Seattle, contractors.
 850 Tons, Pollock, Calif., Doney Creek bridge, to American Bridge Co., Pittsburgh.
 629 Tons, Los Angeles, Dayton Avenue bridge (United States engineer proposal 218), to Stupp Brothers Br.dge & Iron Co., St. Louis.
 105 Tons, Buchanan Dam, lower Colorado River Authority, transmission towers, to Muskogee Iron Works, Muskogee, Okla.

PENDING STRUCTURAL PROJECTS

NORTH ATLANTIC STATES

1200 Tons, Brooklyn, Plumb Beach Channel bridge.
 900 Tons, Lancaster, Pa., warehouse building, Armstrong Cork Co.
 890 Tons, Cecil County, Md., state bridge over Elk River.
 500 Tons, Harrisburg, Pa., International Harvester Co., buildings.
 471 Tons, Allegany County, N. Y., grade separation, highway project R.C. 8529; bids close June 21.
 400 Tons, Rochester, N. Y., store addition for B. Foreman Co.
 400 Tons, Morris County, N. J., State bridges, route 6.
 350 Tons, Rankin, Pa., Rankin bridge approach.
 300 Tons, Rochester, N. Y., Nazareth Academy gymnasium.
 292 Tons, Oswego County, N. Y., includes 60 tons reinforcing bars, grade separation, highway project FAGM, C 39-5; bids close June 21.
 284 Tons, Hamilton County, N. Y., includes 40 tons re-inforcing bars, highway project R.C. 4017; bids close June 21.
 250 Tons, Weathersfield, Vt., State highway bridge PWA 1020-3-F.
 250 Tons, Lewisburg, Pa., engineering building, Bucknell University.
 135 Tons, Rochelle, Pa., Pennsylvania Railroad Co. bridge extension 110.36.
 120 Tons, Canaan and Danielson, Conn., police barracks and garages.
 120 Tons, Chester, Pa., machine and storage buildings, Scott Paper Co.
 115 Tons, Kings Park, N. Y., power plant facilities for State.
 115 Tons, Tyrone, Pa., barn, W. C. Gates.

THE SOUTH

2200 Tons, Richmond, Va., State library building.
 725 Tons, Chincoteague, Va., five State bridges.
 300 Tons, Texas City, Tex., freight car handling crane, Seatrail Lines, Inc.
 170 Tons, Atlanta, Ga., warehouse and garage, Western Electric Co.

CENTRAL STATES

2000 Tons, Lorain, Ohio, bascule bridge, Mount Vernon Bridge Co., Mount Vernon, Ohio, low bidder.
 1800 Tons, Cleveland, Upper West Third Street bridge; bids June 15.
 1094 Tons, Ross County, Ohio, State bridge; bids June 10.
 900 Tons, Dearborn, Mich., new Driveaway Building, Ford Motor Co.
 500 Tons, Lima, Ohio, machine shop, Ohio Steel Foundry Co.
 420 Tons, Akron, Ohio, State grade crossing elimination, Shulco Construction Co. low bidder.
 256 Tons, Adams County, Ohio, State bridge; bids June 2.
 255 Tons, Chicago, alterations to warehouse and factory building, Montgomery Ward & Co.
 250 Tons, Franklin County, Ohio, project; bids June 10.

240 Tons, Springfield, Ohio, store addition, Denton's, Inc.

225 Tons, Peoria, Ill., power house, Keystone Steel & Wire Co.

210 Tons, Richland County, Ohio, State bridge; bids June 10.

200 Tons, Milwaukee, grade separation; bids June 6.

165 Tons, Kalamazoo, Mich., building for American Cyanamid Chemical Corp.

125 Tons, Independence, Kan., and Crane, Mo., railroad bridge.

125 Tons, Fassenden, N. D., State bridge No. 379.32, FAGH-264-B.

120 Tons, Cleveland, extension sheet metal annealing building, Otis Steel Co.

110 Tons, Lucas County, Ohio, State crossing elimination in Ottawa Hills Village, Leeboyco Co., Toledo, low bidder.

100 Tons, Madison County, Ohio, State bridge; bids June 10.

WESTERN STATES

600 Tons, Everett, Wash., Snohomish River bridge; bids June 6.

300 Tons, Denver 23rd Street viaduct; bids in.

178 Tons, Los Angeles, Chrysler assembly plant addition.

170 Tons, Honolulu, T. H., Kamehameha school.

FABRICATED PLATES

AWARDS

900 Tons, Boston, Chelsea Creek, siphon, to Hetzel Steel Co.
 410 Tons, Newark, N. J., 48-in. water main, to National Tube Co.
 200 Tons, Vancouver, Wash., oil tanks to Western Pipe & Steel Co., San Francisco; through Puget Sound Sheet Metal Co.
 100 Tons, Washington, War Department, welded barge pontoons, to American Bridge Co., Pittsburgh.

SHEET PILING AWARDS

1135 Tons, Fort Peck, Mont., United States engineer, to Inland Steel Co., Chicago.
 267 Tons, Los Angeles, United States engineer (Proposal 217), to Bethlehem Steel Co., Los Angeles.

PENDING PROJECTS

100 Tons, Adams County, Ohio, State project in Monroe and Green townships; bids June 2.
 100 Tons, Monroe County, Ohio, State project in Jackson and Lee Townships; bids June 2.
 Unstated tonnage, Cleveland, contract No. 16, Cuyahoga River straightening; bids June 1.

1600 Tons of Ferromanganese Reaches Cleveland

CLEVELAND—The freighter Berto from Holland brought 1600 tons of ferromanganese to Cleveland, May 26, for transshipment to various destinations. While ocean freighters have been regularly visiting the Great Lakes each season, shipments of ferromanganese from abroad have been rare.

Imports at Philadelphia

PHILADELPHIA—The following iron and steel imports were received here during the past week: nine tons of manganese ore, eight tons of steel bands and 25 tons of structural shapes from France; nine tons of steel tubes and 10 tons of steel bars from Sweden; 76 tons of steel bars, 43 tons of steel bands and 191 tons of structural shapes from Belgium.

NON-FERROUS...

...Stronger foreign markets build better sentiment here...
Copper sales average about 1200 tons a day...July lead
call very heavy...Spelter demand light.

NEW YORK, May 29—The comparative quietness of the European scene in the past week, which was undoubtedly responsible for the higher prices ruling on the London metal exchange, and the better stock market here have provided considerable new strength to the domestic non-ferrous market. Although the week's total business

was not noticeably better than in the preceding six-day period, prices were the firmest they have been in some time. Domestic copper sales are averaging about 1200 tons a day at the unchanged producers' price of 10c. per lb., Valley delivery. While this figure still is not very large, it is an improvement over the average daily sales of April. Standard trading in London

spurred last week and prices in the export market rose to 10.05 on Friday as compared with 9.95c. on Tuesday a week ago. Another indication of the better sentiment here was the boosting of copper scrap items $\frac{1}{8}$ c. per lb. at the end of the week.

Zinc

Although the official figures are not available at time of going to press, the past week's sales undoubtedly will show a further tapering in demand. Outside of some quiet filling in, there was little activity in evidence during the week. In keeping with general sentiment abroad, the London price continues to improve slowly. Friday's close of £14 1s 3d, or 2.94c. per lb., London, compared with 2.86c. on the preceding Tuesday. It has been estimated that the London price level will have to gain at least 10s. further before any change in the present domestic price of 4.89c. per lb., New York, might be expected.

Lead

The demand for lead in the past week was in excellent volume, comparing very favorably with the volume of the preceding six-day market period. The week got off to a slow start, but toward the end of the week, as stock prices rose, consumers covered very freely in June positions. Another feature of the past week was the large waiting lists for July metal which developed. The opening of the July books this morning brought a rush of buying and before noon one seller reported selling several times the day's intake. The domestic price continues unchanged at 4.75c. per lb., New York, but buyers are following the London price very closely as it gradually moves to higher ground. At the close of the past week this price was around 3.06c. per lb. on spot, giving a theoretical import cost at New York of 4.91c. per lb.

Tin

Outside of professional interest in June and July deliveries, which have been available at rather substantial discounts, there was very little trading in the tin market in the past week. Consumers, when they did appear, were interested chiefly in spot and June carlots. Supplies for this latter month are becoming increasingly difficult to obtain. Despite the dull business, prices were firm all week. Prompt Straits today are quoted at 49c. per lb., New York, as compared with 48.70c. on Tuesday a week ago.

NON-FERROUS PRICES

Cents per lb. for early delivery

	May 24	May 25	May 26	May 27	May 29
Copper, Electrolytic ¹	10.00	10.00	10.00	10.00	10.00
Copper, Lake	10.00	10.00	10.00	10.00	10.00
Tin, Straits, New York	48.85	48.85	49.00	49.00	49.00
Zinc, East St. Louis ²	4.50	4.50	4.50	4.50	4.50
Lead, St. Louis ³	4.60	4.60	4.60	4.60	4.60

¹ Delivered Conn. Valley, deduct $\frac{1}{4}$ c. for New York delivery. ² Add 0.39c. for New York delivery. ³ Add 0.15c. for New York delivery.

Warehouse Prices

Cents per lb., Delivered

New York Cleveland	
Tin, Straits pig	50.00c.
Copper, Lake	11.25c.
Copper, electro	11.125c.
Copper, Castings	10.75c.
*Copper sheets, hot-rolled	18.12c.
*High brass sheets	16.48c.
*Seamless brass tubes	19.23c.
*Seamless copper tubes	18.62c.
*Brass rods	11.85c.
Zinc slabs	6.15c.
Zinc sheets, No. 9 casks	10.50c.
Lead, American pig	5.75c.
Lead, bar	6.35c.
Lead, sheets, cut	8.00c.
Antimony, Asiatic	15.00c.
Alum., virgin, 99 per cent plus	22.50c.
Alum., No. 1 remelt, 98 to 99 per cent	19.50c.
Solder, $\frac{1}{2}$ and $\frac{1}{2}$	29.50c.
Babbitt metal, commercial grade	21.50c.
	21.75c.

* These prices, which are also for delivery from Chicago warehouses, are quoted with the following percentages allowed off for extras: on copper sheets, 33 $\frac{1}{3}$; on brass sheets and rods, 40, and on brass and copper tubes, 25.

Old Metals

Cents per lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators. Selling prices are those charged to consumers after the metal has been prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	8.00c.	9.625c.
Copper, hvy. and wire	7.00c.	7.375c.
Copper, light and bot-toms	6.125c.	6.375c.
Brass, heavy	4.125c.	4.625c.
Brass, light	3.25c.	4.00c.
Hvy. machine compo-sition	6.125c.	7.625c.
No. 1 yel. brass turnings	4.00c.	4.50c.
No. 1 red brass or com-pos. turnings	6.00c.	6.50c.
Lead, heavy	3.625c.	4.50c.
Cast aluminum	6.50c.	7.75c.
Sheet aluminum	12.25c.	13.75c.
Zinc	2.125c.	3.375c.

Miscellaneous Non-Ferrous Prices

ALUMINUM, delivered; virgin, 99 per cent plus, 20c.-21c. a lb.; No. 12 remelt No. 2 standard, 19c.-19.50c. a lb. NICKEL, electrolytic, 35c.-36c. a lb. base refinery, lots of 2 tons or more. ANTIMONY, prompt, New York; Asiatic, 14c. a lb. f.o.b.; American, 12c. a lb. QUICK-SILVER, \$86-\$88 per flask of 76 lb. BRASS INGOTS, commercial 85-5-5-5, 10.25c. a lb.

PLANT EXPANSION AND EQUIPMENT BUYING

◀ NORTH ATLANTIC ▶

American Can Co., 230 Park Avenue, New York, has let general contract to Lundoff-Bicknell Co., 100 North LaSalle Street, Chicago, for one-story addition, 165 x 205 ft., to branch plant at Houston, Tex., for storage and distribution. Cost about \$100,000 with equipment.

Arrow Lamp Mfg. Co., Inc., 34 West Twentieth Street, New York, electric lamps and lighting equipment, has leased a floor in building at 22 West Nineteenth Street, about 16,000 sq. ft. of floor space, for plant.

Quartermaster, West Point, N. Y., asks bids until June 5 for one steam magazine feed boiler (Circular 1052-162); until June 7, 12 dry sinker type jack hammers, two paving breakers (Circular 1052-168), two milling machines, one grinding machine, two metal-cutting power saws, one metal-working band saw, one radial saw and one shaper (Circular 955-81); until June 8, two motor-driven screw-cutting lathes, three work benches with steel legs, 19 steel top tables and one steel welding table (Circular 955-83).

Sherron Metallic Corp., 1185-1223 Flushing Avenue, Brooklyn, metal products, has filed plans for extensions and improvements in plant. Cost about \$50,000. Kolb & Miller, 31 Union Square, New York, are architects.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until June 6 for electric and manual operation steam whistles and spare parts (Schedule 6345); until June 9, six kingpost bearings for boat crane (Schedule 6426) for Brooklyn and Philadelphia Navy yards; one motor-driven generator (Schedule 6406) for Brooklyn yard.

National Gypsum Co., East River and 150th Street, New York, building products, wall board, etc., has taken out a permit for one-story addition, 118 x 453 ft., for storage and handling of raw material. Cost about \$125,000 with loading, conveying and other mechanical equipment. Main offices of company are Buffalo.

Signal Corps Procurement District, Army Base, Fifty-eighth Street and First Avenue, Brooklyn, asks bids until June 9 for 30,000 knives (Circular 254), 30,000 pliers (Circular 255), 15,000 flash lights, 600 lamp holders, 300 reflectors and other equipment (Circular 256).

Standard Oil Co. of New Jersey, 26 Broadway, New York, has approved plans for one-story bulk storage and distributing building, 90 x 200 ft., at Constable Hook refinery, Bayonne, N. J., with loading platforms and garage. Cost about \$85,000 with equipment.

William Kirk and Alfred Draghi, Borden-town, N. J., operating a steel-treating works, have leased property at 35-57 Verona Avenue, Newark, N. J., and will remove to new location and increase capacity.

Commanding Officer, Ordnance Department, Picatinny Arsenal, near Dover, N. J., asks bids until June 6 for 10,000 lead seals with 8-in. anti-strip wire (Circular 851); until June 9, one hydraulic pump (Circular 820), one motor-driven precision lathe (Circular 822), one diamond intention hardness tester (Circular 824), one bench-type milling machine (Circular 828), one smokeless powder macerating machine (Circular 833).

Solar Mfg. Corp., 162 West Twenty-Third Street, Bayonne, N. J., radio condensers and equipment, electrical parts, etc., has leased two-story building at Avenue A and Twenty-fifth Street for expansion. Main offices are at 599 Broadway, New York.

Bureau of Yards and Docks, Navy Department, Washington, will prepare plans soon for extensions and improvements in Philadelphia Navy Yard, for proposed construction of one of new 45,000-ton battleships at shipway No.

2. Appropriation of \$405,000 is being made available.

Stegmaier Brewing Co., Wilkes-Barre, Pa., has approved plans for plant alterations and improvements, including equipment. Cost close to \$50,000.

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until June 6 for shot blasting equipment for automatic cleaner of interior and exterior of 105-mm. 5-in., and 155-mm. shells (Circular 1198), high-speed motor-driven precision tapping machine (Circular 1186), painting machine (Circular 1183), seven slide tools (Circular 1208), optical dividing head, with tail center (Circular 1197); until June 7, two second trim machines, caliber 0.30 (Circular 1180); until June 9, one 150-ton hydraulic press (Circular 1142).

◀ BUFFALO DISTRICT ▶

A. E. Rittenhouse Co., East Street, Honeoye Falls, N. Y., manufacturer of conduit benders and other mechanical equipment, has let general contract to Swartout & Rowley, 548 Mount Hope Avenue, Rochester, N. Y., for one-story addition, 70 x 150 ft. Cost close to \$60,000 with equipment.

United States Engineer Office, Federal Building, Buffalo, asks bids until June 5 for one vertical automatic bilge pump (Circular 151).

Jamestown Metal Equipment Co., Inc., Allen Street Extension, Jamestown, N. Y., automobile radiators and allied equipment, is erecting two-story addition, 55 x 104 ft., for which general contract recently was let to Warren Construction Co., 335 Steele Street. Cost over \$60,000 with equipment.

◀ WASHINGTON DIST. ▶

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until June 6 for tank car parts, including side friction members, double coil springs, center friction members, friction casings, etc. (Circular 398-147); until June 19, shop and garage equipment, including lathes, degreaser tanks, welders, welding outfits, tool cabinets, automobile jacks, motor testers, platform trucks, boring bars, electric grinders, air compressors, roller car type jacks, pneumatic hammers, engine lathes, gasoline pumps and other equipment (Circular 398-109).

Rustless Iron & Steel Corp., 3400 East Chase Street, Baltimore, plans expansion and improvements, comprising several new one-story units. Cost reported over \$850,000 with machinery. Bids are scheduled to be asked soon.

Chemical Warfare Service, Edgewood Arsenal, Edgewood, Md., asks bids until June 5 for 30,300 aluminum base angle tubes and 34,250 aluminum base elbow nozzles (Circular 442), solder wire (Circular 447); until June 8, one bandsaw (Circular 454).

General Purchasing Officer, Panama Canal, Washington, asks bids until June 5 for steel snatch blocks, wood sheath snatch blocks, tackle blocks, metallic steam hose, 18 sets of pipe dies, split dies, hacksaw blades, cold chisels, twist drills, files, etc. (Schedule 3470); until June 8, manganese steel dredge dipper lips, elliptic springs, coil chain, etc. (Schedule 3473); until June 9, hand taps, steel wood screws, brass machine screws, 720 ship scrapers, eight 25-ton screw jacks, sledge hammers, pipe wrenches, steel belt lacing and other equipment (Schedule 3474).

Board of District Commissioners, Laurel, Md., asks bids until June 9 for extensions and improvements in power house at training school, including new boiler unit and auxiliary equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until June 6 for alloy steel forgings (Schedule 6380) for Washington yard; steel propeller castings (Schedule 6379); until June 9, motor-driven drilling and tapping machine (Schedule 6106) for Alexandria, Va., yard, motor-driven double-cylinder surfacer (Schedule 6368), two electric crane trucks, revolving, with gas-electric power unit (Schedule 6386); until June 13, one motor-driven, bench-type milling machine, with driving unit (Schedule 6391) for Eastern and Western yards.

◀ SOUTH ATLANTIC ▶

United States Engineer Office, Customhouse, Wilmington, N. C., asks bids until June 5 for six hand winches and spare parts, including two cast steel drums, two cast steel pinions, two cast steel gears, four cast steel gipsies, four steel hand wheels (Circular 141).

Horton Motor Lines, Inc., Charlotte, N. C., plans production of motor-driven tractors as branch of business and will establish new department for this purpose, with facilities for partial parts production and complete assembling of units.

Purchasing and Contracting Officer, Quartermaster Corps, Fort Benning, Ga., asks bids until June 9 for galvanized malleable pipe fittings, nipples, unions, valves and other equipment (Circular 148-144).

◀ NEW ENGLAND ▶

Coca-Cola Bottling Co., Inc., 68 Woodbridge Street, New London, Conn., plans new one and two-story mechanical-bottling plant, 62 x 105 ft. Cost close to \$50,000 with equipment. Jesse M. Shelton, 133 Luckie Street, N. W., Atlanta, Ga., is architect.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until June 9 for one 150-kva. air-operated spot welder (Schedule 6428) for Boston Navy Yard; until June 13, motor-driven wood-cutting bandsaw and motor-driven swing cut-off saw (Schedule 6429) for Portsmouth, N. H., yard; until June 16, main condenser turbine-driven circulating pumps and spare parts (Schedule 6407), fuel oil pumps for port and cruising, with motors, controllers and spare parts (Schedule 6400) for Boston and Charleston Navy Yards.

Pratt & Whitney Division, United Aircraft Corp., East Hartford, Conn., aircraft engines and parts, has let general contract to R. G. Bent Co., 93 Edwards Street, Hartford, for one-story addition, 35 x 80 ft., to be used as a test shop. Cost close to \$45,000 with equipment. Albert Kahn, Inc., New Center Building, Detroit, is architect and engineer.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until June 5 for nine motor-driven inclinable punch presses (Circular 445); until June 6, two hydraulic surface grinders, 10 x 36 in., with one motor drive, for wet grinding (Circular 447).

◀ SOUTH CENTRAL ▶

Schott & Co., Inc., 524 Howard Avenue, New Orleans, meat packer, asks bids on general contract until June 6 for new two-story packing plant at Clara and Poydras Streets. Cost close to \$50,000 with equipment. Favrot & Reed, Nola Building, are architects.

United States Engineer Office, Second District, New Orleans, asks bids until June 5 for 2,500,000 sq. ft. of galvanized stapled wire fabric, or 2,500,000 sq. ft. of galvanized welded wire fabric (Circular 444).

City Council, Burkesville, Ky., plans municipal electric power plant, using diesel engine-generator units and auxiliaries. Cost close to \$70,000 with equipment. Proposed to ask bids soon. J. S. Watkins, McClelland Building, Lexington, Ky., is consulting engineer.

Rapides Packing Co., Alexandria, La., meat packer, plans rebuilding part of plant near city limits recently destroyed by fire. Loss about \$75,000 with equipment.

Mississippi River Commission, Vicksburg,

Miss., asks bids until June 13 for one water-pumping unit complete, with direct-connected electric motor (Circular 25).

◀ SOUTHWEST ▶

Anheuser-Busch, Inc., 721 Pestalozzi Street, St. Louis, has let general contract to Gamble Construction Co., 620 Chestnut Street, for alterations and improvements in three-story masonry house unit. Cost close to \$50,000 with equipment.

Manor Baking Co., and Campbell Taggart Associated Bakeries, Inc., 4050 Penn Avenue, Kansas City, Mo., affiliated, will take bids soon on general contract for one and two-story and basement, U-shaped automobile service, repair and garage building on Fortieth Street, for company motor trucks and cars. Cost about \$130,000 with equipment. E. L. Brintnall, address noted, is company architect; Boillot & Lauck, 1012 Baltimore Avenue, are associated architects.

Mid-Continent Petroleum Corp., Tulsa, Okla., has approved plans for expansion in oil refinery at West Tulsa, including new units for processing lubricating oils under a new production method. Cost close to \$800,000 with machinery.

Colonial Baking Co., 4410 Gravois Street, St. Louis, has let general contract to Woermann Construction Co., 3800 West Pine Boulevard, for two-story addition, 26 x 92 ft. Cost close to \$50,000 with ovens, conveyors and other equipment.

Commanding Officer, Ordnance Department, San Antonio Arsenal, San Antonio, Tex., asks bids until June 12 for an electric drill, electric woodworking table and electric sander (Circular 35).

Potter Brothers, Kilgore, Tex., operating Utah Refining Co., plan new oil refining plant on local site, to handle an initial capacity of 2500 bbl. of crude oil per day. A steel tank storage department will be built, pumping station, boiler house and other structures. Cost about \$150,000 with equipment.

City Council, Temple, Tex., plans new municipal electric power plant, including distributing lines. Cost about \$850,000. Special election has been called to approve bonds in amount noted and bids are expected to be called shortly thereafter.

◀ WESTERN PA. DIST. ▶

Pittsburgh Gray-Iron Foundry Co., 1117 Reedsdale Street, Pittsburgh, plans rebuilding part of plant recently destroyed by fire. Loss reported about \$250,000 with equipment.

United States Engineer Office, New Post Office Building, Pittsburgh, asks bids until June 15 for cast iron air vents, 24-in. cast iron coupling, four 36-in. cast iron couplings, three 24-in. cast iron connectors, cast iron curb ring, cast iron discharge bell mouth, anchor bars, pipe clamps, bolts, gaskets, etc., for Mahoning dam (Circular 656).

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., has authorized addition to branch plant at Belle, W. Va., comprising several units, for production of ethylene glycol. Cost over \$650,000 with equipment.

◀ OHIO AND INDIANA ▶

International Harvester Co., Motor Truck Division, 180 North Michigan Avenue, Chicago, has asked bids on general contract for one and two-story factory branch, service and distributing plant at Cincinnati, 220 x 275 ft. Cost about \$250,000 with equipment. J. D. McGann is company engineer in charge, first noted address.

City Street Department, City Hall, Dayton, Ohio, has approved plans for one-story municipal shop and garage building, 27 x 507 ft., on Amelia Street, for street-cleaning machinery, motor trucks and other equipment. Cost over \$150,000 with equipment. John F. Hale is city engineer.

Ohio Wax Paper Co., 780 Frebis Avenue, Columbus, Ohio, is arranging early call for bids for one-story addition, 70 x 240 ft., to paper-processing mill. Cost close to \$300,000

with equipment. L. A. DeGuere, Wisconsin Rapids, Wis., is consulting engineer.

Contracting Officer, Aircraft Radio Laboratory, Wright Field, Dayton, Ohio, asks bids until June 9 for one motor-driven precision lathe, turret milling machine, super-spacer machine, die-maker's screw press, drill grinder, drill press, hand brake, foot-power shear, jig borer, vises, chucks and other equipment (Circular 15-ARL), generator, softening-point apparatus, steel balls, electric counter, portable Kelvin bridge, galvanometer and other equipment (Circular 15-ARL).

Contracting Officer, Materiel Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until June 5 for 12 motor-driven bench-type drill presses, hand-operated sheet metal brake, hand-operated box and pan sheet metal brake, hand-power sheet metal slip roll former, power hacksaw, and motor-driven sheet metal machine for combination burring, turning, bending, elbow-edging and slitting machine (Circular 1085), sheet metal screws and drive screws (Circular 1074), about 250 lathe mandrels (Circular 1097), ignition shielded manifold assemblies (Circular 1080); until June 6, aluminum alloy tubing (Circular 1089).

Board of Public Works, Rensselaer, Ind., asks bids until June 5 for extensions and improvements in municipal power plant, including boiler unit, stoker, pumps and accessories, cooling tower and other equipment. Cost about \$70,000. John W. Moore & Son, Indiana Pythian Building, Indianapolis, are consulting engineers.

◀ MICHIGAN DISTRICT ▶

Union Motor Freight Terminal, Inc., Detroit, care of Edwin E. Coe, Park Avenue Building, organized recently, will take bids early this month on general contract for new freight terminal on 10-acre tract bounded by West Jefferson Avenue, West Fort, Twenty-first and Twenty-third Streets, consisting of three main one-story structures, each 90 x 400 ft., five-story office and administration building, 80 x 90 ft., garage and service unit, 95 x 100 ft., and smaller buildings. Cost about \$1,000,000 with conveying, loading and other mechanical-handling equipment. Lane-Davenport-Meyer, Donovan Building, are architects.

Schust Baking Co., Saginaw, Mich., has asked bids on general contract for three-story addition to main bakery and storage and distributing unit adjoining. Cost close to \$150,000 with mixing machinery, traveling ovens, loaders and other mechanical equipment.

Timken-Detroit Axle Co., 100 Clark Avenue, Detroit, has acquired plant and business of Delta Mfg. Co., Milwaukee, manufacturer of woodworking machinery and parts, and will operate as a unit of organization.

◀ MIDDLE WEST ▶

George H. Spangler Co., Race Street, Rockford, Ill., screw machine products, has let general contract to Linden & Son, Inc., 1192 Tenth Street, for one-story addition, 40 x 54 ft., to be used as a machine shop. Cost close to \$40,000 with equipment.

Norris Grain Co., 141 West Jackson Boulevard, Chicago, plans rebuilding two grain elevators at Chicago and 103rd Streets, and Calumet River, recently destroyed by fire. Units will have capacity of about 2,000,000 bu. Cost over \$400,000 with elevating, conveying, screening and other equipment.

Signal Corps Procurement District, 1819 West Pershing Road, Chicago, asks bids until June 6 for 15,000 to 36,000 ft. of cable (Circular 113); until June 16, frame assemblies, trunk boards, connector shelves, line finder shelf and other equipment (Circular 114).

Universal Hoist & Mfg. Co., Waterloo Road, Cedar Falls, Iowa, hoists, conveyors and allied equipment, has let general contract to W. W. Coombs, Cedar Falls, for two one-story additions, 40 x 50 ft., and 20 x 50 ft. Cost close to \$40,000 with equipment.

Abingdon Sanitary Mfg. Co., Abingdon, Ill., sanitary ware, has let general contract to Campbell, Lowrie & Lautermilch, Inc., 400

West Madison Street, Chicago, for one-story addition, 100 x 590 ft., for storage and distribution. Cost over \$90,000 with equipment. C. F. Morrison, 221 North LaSalle Street, Chicago, is consulting engineer.

Commanding Officer, Ordnance Department, Rock Island Arsenal, Rock Island, Ill., asks bids until June 16 for four bomb trailers (Circular 751).

Chicago, Rock Is'and & Pacific Railroad Co., LaSalle Street Station, Chicago, and 125 South Third Street, Minneapolis, will take bids soon on general contract for one-story freight terminal, 180 x 540 ft., at Minneapolis. Refrigerating department will be installed with capacity of 36 cars. Cost about \$300,000 with mechanical-handling and other equipment.

Quartermaster, Fitzsimons Hospital, Denver, asks bids until June 13 for one engine lathe (Circular 308-54).

◀ PACIFIC COAST ▶

Ducommun Metals & Supply Co., 219 South Central Avenue, Los Angeles, will take bids on general contract early this month for new one-story storage and distributing plant on six-acre tract at Alameda and Forty-ninth Streets, Vernon, consisting of a main one-story unit, 290 x 600 ft., with auxiliary one-story building adjoining, 20 x 400 ft. Five traveling cranes will be installed, in addition to other handling equipment. Cost close to \$300,000. Albert C. Martin, Higgins Building, is architect. Structural steel award has been made to Consolidated Steel Corp., 5700 South Eastern Avenue.

Commanding Officer, Ordnance Department, Benicia Arsenal, Benicia, Cal., asks bids until June 5 for one floating table (Circular 44).

Crown-Willamette Paper Co., Camas, Wash., will take bids soon on general contract for four-story addition for expansion in paper-converting department, and roll storage and distribution division. Cost over \$100,000 with equipment.

Department of Water and Power, 207 South Broadway, Los Angeles, is arranging immediate call for bids on general contract for four buildings at underground headquarters, 110 South Boylston Street, comprising a one-story equipment storage and distributing building, 45 x 110 ft.; five-story service, repair and garage structure, 112 x 187 ft.; three-story office and smaller general building. Cost close to \$500,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until June 9 for two gasoline engine-driven industrial shop trucks (Schedule 6385); until June 13, one wheel-mounted electric motor power portable tiering machine; combination hand and electric-operated portable, telescopic tiering machine; 24 two-wheel hand-operated trucks; hydraulic cable reel lift truck; 26 four-wheel heavy-duty hand trucks; 43 rubber-tired hand-operated trucks; 12 hand lift-trucks and 12 hand-operated barrel trucks; 100 platform skids (Schedule 6433) for San Diego Naval Air Station; one 300 kva. welding machine (Schedule 6362) for Mare Island Navy Yard; motor-driven, back-gearred screw-cutting precision lathe (Schedule 6381), motor-driven, bench-type milling machine, with driving unit (Schedule 6382) for Seattle yard.

Purchasing Officer, Department of Interior, Washington, asks bids until June 6 for four pneumatic rock drills and one paving breaker for Cedar City, Utah, and Lemon Cove, Cal. (Circular 4982).

◀ FOREIGN ▶

John Marston, Ltd., Wolverhampton, England, manufacturer of automobile and aircraft radiators, tanks, oil coolers and other mechanical products, has secured about 25 acre tract for expansion, comprising several one-story buildings totaling 150,000 sq. ft. of floor space, with facilities for employment of about 1000 persons. Cost over \$800,000 with machinery. Proposed to have initial unit of about 50,000 sq. ft. completed in summer. Company is a subsidiary of Imperial Chemical Industries, Ltd., Millbank, London.

REINFORCING STEEL

Awards of 7400 tons; 9300 tons in new projects.

ATLANTIC STATES AWARDS

700 Tons, Washington, administration group building, to Bethlehem Steel Co., Bethlehem, Pa., through Charles T. Tompkins, contractor.
490 Tons, Newark, N. J., housing project, to Bethlehem Steel Co., Bethlehem, Pa.
300 Tons, Jamaica, N. Y., Triborough Hospital for tuberculosis patients, to Wickwire-Spencer Co. through Eureka Mfg. Co., contractor.
275 Tons, Brooklyn, newspaper plant, to Truscon Steel Co., Youngstown.
200 Tons, Syracuse, N. Y., housing development, blocks F & G, to Bethlehem Steel Co., through W. J. Burns Co., Syracuse, contractor.
120 Tons, Queens County, N. Y., Cross Island Parkway, MC-39-13, to Igoe Brothers through J. Leopold & Co., Contractor.

CENTRAL AND WESTERN STATES

2850 Tons, San Francisco, Rincon Hill post office, to Soule Steel Co., San Francisco; through George A. Fuller Co., Los Angeles, contractor.
785 Tons, Los Angeles, Treasury Department (Invitation A9153, list 304) to Judson Steel Co., Oakland, Cal.
675 Tons, Spokane, Wash., first unit Centennial flour mill and grain bins, to Northwest Steel Rolling Mills, Seattle; through Austin Co., Seattle, Alloway & Georg, Spokane, respectively, contractors.
222 Tons, East Wallace, Idaho, highway bridges to Soule Steel Co., Portland, Ore.; through Sam Orino, Portland, Ore., contractor.
200 Tons, San Bernardino, Cal., two highway bridges to Consolidated Steel Corp., Los Angeles; through White & Wilberg, Santa Monica, Cal., contractor.
175 Tons, Gundy County, Ill., bridge, route 77, to Bethlehem Steel Co.
160 Tons, Mazonia, Ill., bridge, to Calumet Steel Co.
127 Tons, San Francisco, Alcatraz Island buildings to Gilmore Steel & Supply Co., San Francisco; through Louis C. Dunn, San Francisco, Contractor.
100 Tons, Columbus, Ohio, Batelle Memorial Institute, to West Virginia Rail Co., through E. Elford & Son, Contractor.

PENDING REINFORCING BAR PROJECTS

ATLANTIC STATES

700 Tons, Brooklyn, viaduct, Shore Road, Parkway, MS-39-9.
673 Tons, Orange County, N. Y., mostly mesh, includes 30 tons shapes, highway project R. C. 4027; bids close June 21.
637 Tons, Clinton County, N. Y., mostly mesh, includes 83 tons shapes, highway project R. C. 4016, Louis Longhi & Son, Torrington, Conn., low bidders.
383 Tons, Westmoreland Count, Pa., sections 2B and 3A1, Pennsylvania Turnpike Commission.
370 Tons, Hamilton County, N. Y., mostly mesh, highway project R. C. 4023; bids close June 21.
350 Tons, Washington, extension steam distribution system.
264 Tons, Westmoreland County, Pa., section 5A, Pennsylvania Turnpike Commission.
238 Tons, Suffolk County, N. Y., includes 38 tons shapes, highway project S.S.P. 39-3; bids close June 21.
200 Tons, Brooklyn, Shore Road Parkway, MSO-39-5.
200 Tons, Elkton, Md., Elk River bridge.
200 Tons, Epping, N. H., State road, Lane Construction Co., Meriden, Conn., contractor.
200 Tons, Richmond, Va., Virginia State Library.
190 Tons, Chincoteague, Va., Chincoteague Island bridge.
175 Tons, Westmoreland County, sections 5 and 6, Pennsylvania Turnpike Commission.
150 Tons, Shonghum, N. J., Shonghum Mountain Sanatorium.
150 Tons, Haverhill, Mass., State road and bridge.

CENTRAL AND WESTERN STATES

2000 Tons, Alameda, Cal., Navy barracks (revised tonnage estimate); bids in.
850 Tons, Little Rock, Ark., Great Salt Plains reservoir.

600 Tons, New Orleans, laboratory building for Department of Agriculture, H. A. Rife Construction Co., Dallas, Tex., low bidder on general contract.

450 Tons, Chicago, laboratory for Department of Agriculture, O'Neil Construction Co., Chicago, low bidder on general contract.

400 Tons, Owensboro, Ky., river intake (previously reported), Foundation Co., New York, low bidder on general contract.

390 Tons, Marion, Ind., sewage plant.

205 Tons, Boulder City, Nev., Boulder City Canyon project (Invitation D-23038-A); bids in.

200 Tons, Oregon and Washington points tower footings, Bonneville Coulee transmission line; bids June 15.

200 Tons, Urbana, Ill., Students' Union building, University of Illinois, English Brothers, Champaign, Ill., low bidders on general contract.

CANADA

New business showing some improvements

TORONTO, May 29—New business is showing some improvement in the Canadian iron and steel markets. Sales of sheets and bars have gained considerably in the past two or three weeks. While most of the new orders are for immediate delivery some of the larger users have placed contracts for a month or six weeks ahead. Announcement was made during the week that Hamilton Bridge Co., Hamilton, Ont., has been awarded contract for 4000 tons of structural steel for the \$1,000,000 plant to be erected by Aluminum Co. of Canada, Ltd., at Toronto. It is understood that awards for some 3000 tons of structural steel for the new Bank of Montreal Building at Toronto will be announced soon. Export demand for steel continues in good volume and Canadian plant operations have started to move upward. Canadian steel interests report price unchanged with no immediate indication that the softening tendency that has developed recently in the United States will spread to this country.

Merchant pig iron sales showed minor gain for the week, but melters continue to buy as demands dictate and no forward delivery on big tonnage contracts have been reported. Sales are in small lots. The melt is holding to an average of about 60 per cent. Most of the large melters still are running on stock piles and are not replenishing holdings at this time. Pig iron production, however, is increasing, with the betterment reported in basic iron for further use of producing companies.

Steel Centers, Detroit Report Highest Wages

CHICAGO—Factory wage earners in the Chicago district in 1937 received an average annual pay of \$1,373, as compared with \$1,233 in New York, \$1,220 in Philadelphia, \$1,138 in Boston, \$1,219 in St. Louis, \$1,180 in Baltimore, and \$1,274 in Cincinnati. In Detroit, however, the annual average amounted to \$1,594, while in the high wage steel centers of Pittsburgh and Cleveland, the average figured \$1,532 and \$1,424 respectively.

Census bureau returns provided these figures, which were compiled for this report by the Illinois Manufacturers' Association.

CAST IRON PIPE

Mission Township Board. Mission Township, near Topeka, Kan., care of O. J. Eidmann, New England Building, Topeka, consulting engineer, plans pipe lines for water system in district west of city, securing supply from city mains. Estimates of cost are being made.

Abilene, Tex., plans pipe line extensions and replacements in water system. Fund of \$576,800 is being arranged for this and other waterworks installation, including new pumping station, of which about \$428,316 will be a Federal loan.

Beulah, Mich., plans water pipe line system and other waterworks installation. Cost about \$34,500. Francis Engineering Co., Saginaw, Mich., is consulting engineer.

Board of Awards. Baltimore, has rejected bids recently received for main water line in Southeastern district, and will ask new bids soon. Low bid was tendered by John Matricciani, 229 South Exeter Street, at \$136,821.

Metropolitan Utilities District. Eighteenth and Harney Streets, Omaha, Neb. Col. T. A. Leisen, secretary, plans water pipe line system in recently created districts Nos. 1561, 1567, 1569, 1571, 1573 and 1574.

Water Department. Fresno, Cal., plans pipe line extensions and replacements in water system. Cost about \$41,440. Plans also include new pumping unit and auxiliary equipment at station No. 8; installation of meters, air compressor and other equipment. Application has been made to finance department of City Commission for fund of \$303,819 for these and other extensions and improvements in system during coming fiscal year.

Marblehead, Ohio., plans pipe lines for water system to cost about \$50,000; also 100,000-gal. elevated steel tank and tower, filtration plant and other waterworks installation. Financing is being arranged through Federal aid. W. W. Henkelman, Beilstein Building, Sandusky, Ohio, is consulting engineer.

Waurika, Okla., plans pipe line extensions in water system. Fund of about \$75,000 will be arranged for this and other waterworks installation, and sewage disposal plant, of which about \$25,000 will represent a bond issue.

Board of Public Utilities. Kansas City, Kan., has awarded contract to U. S. Pipe & Foundry Co., at \$46,819.89 for cast iron pipe and fittings for water system extensions in connection with new Quindaro pumping station. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Cushing, Okla., plans pipe line extensions in water system. Appropriation has been arranged through Federal aid. Work will begin soon. J. W. Flint is city manager.

Spokane, Wash., has awarded 185 tons of 6-in. pipe to Pacific States Cast Iron Pipe Co., Provo, Utah.

Tucson, Ariz., has taken bids on 200 tons of 2, 4, 6, and 8-in. pipe.



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ECONOMICAL to use—because they're installed with greater ease and speed—these new Crane fittings for small lines permit wider application of welded piping. Crane Socket Welding Fittings are not made from ordinary screwed fittings blanks—they're engineered for welding, of forged steel—for more efficient and durable service.

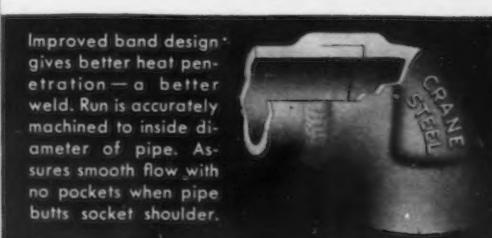
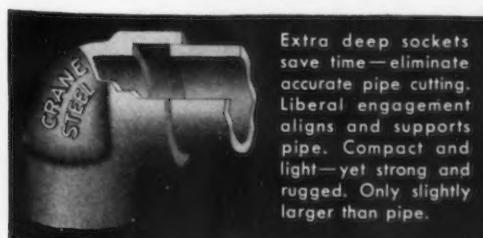
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eling and prevent the danger of welding icicles obstructing the flow, but now, pipe need not be cut to accurate length—or even square.

Crane design eliminates the heavy end bands that prevent uniform heat penetration in ordinary fittings. Conforming to advanced welding technique, electric arc or gas, Crane fittings provide a superior weld—with less metal, and in less time. The joint is stronger than the pipe itself.

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